

**External risks impacting on the scuba diving industry in the East African
Marine Ecoregion**

by

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ABSTRACT

Scuba diving is a popular marine recreational activity along the eastern and southern coast of Africa. This region is characterised as the East African Marine Ecoregion (EAME) and is known for its richness in marine fauna and flora, including some of the Indian Ocean's most diverse and abundant coral reef ecosystems, making it a popular destination for scuba divers.

The future of the scuba diving industry has come under threat as a result of environmental, social, political and economic impacts, and there is a need to better understand how these external risks impact on scuba diving tourism businesses in the EAME. Empirical evidence suggests that external risks, both international and domestic, have an effect on the tourism industry as a whole. However, limited research has been conducted on the impact of such external risks on the dive tourism industry specifically. Existing research has also focused extensively on environmental risks rather than on how external risks of a political, economic and social nature affect dive operator sustainability in the EAME. Most studies have also focused on the demand side (divers) as opposed to the supply side (dive operators). In addition, as dive tourists have greater flexibility to change their destination should risks arise, this threatens the success of dive operators in higher risk areas.

To address these problems, the primary objective of the research undertaken sought to comprehensively identify the impact of external risks (environmental, economic, social and political) on dive operators in four countries within the EAME from a supply-side perspective. In order to achieve the primary objective, the following secondary objectives were achieved:

1. Identified scuba diving tourism operators in the EAME and their scope of operation.
2. Determined the external risks most relevant to dive operators in the EAME and assessed their level of impact.
3. Compared the individual external risks experienced by each of the countries in the EAME (Kenya, Tanzania, Mozambique and South Africa) using a cross-case analysis.
4. Assessed the perception of dive operators regarding whether external risks would influence a dive tourist's decision to travel to the dive operator's area of operation in the EAME

The study consisted of two phases. Phase 1 comprised structured interviews with a select group of dive operators to gain insight into the external risks most prevalent in the scuba diving industry, as well as to assist in developing a quantitative structured survey (Phase 2), which was subsequently completed by dive operators in Kenya, Tanzania, Mozambique and South Africa. Data was imported into SPSS for quantitative statistical analysis.

From the primary data collected, the major findings from this study determined that current economic and political risks have the greatest impact on dive operators in the EAME, and this trend is expected to continue. Environmental degradation of coral reefs, while not seen as a threat at present, constitutes a key threat for the near future. The greatest influences expressed in terms of risk categories impacting on dive tourism are domestic economic risks, international economic risks, domestic political risks and international political risks. A cross-case analysis conducted on the four countries concluded that external risks have varying effects within the different countries. Finally, the results indicated that external risks significantly influence a dive tourist's decision to travel to the EAME.

By identifying and assessing the external risks that have an impact on dive operators in the EAME, this research contributes to knowledge on the dive tourism industry in the EAME, as well as dive tourism further afield and the wider field of tourism management. The study's findings create awareness of the effect that external risks have on dive operators in the region. A conceptual framework was developed which encompasses external risks in the scuba diving industry. Risk radars, risk maps and colour-coded tables were further outputs this study which can assist businesses, society and economies in responding to current and future threats and crises in a more informative and intuitive way. This can be achieved by implementing risk management strategies to mitigate or reduce exposure to external risks; strengthening stakeholder involvement along the tourism value chain; and stressing the need for government involvement towards the protection of the environment and promotion of small business growth in the region. Future research can include a wider view of the marine tourism industry and other areas of the Blue Economy.

Key terms: scuba diving, scuba diving tourism, scuba diving industry, marine tourism, coral reef tourism, sustainable tourism, East African Marine Ecoregion (EAME), external risks, international risks, domestic risks, environmental risks, economic risks, social risks, political risks

Eksterne risiko's wat 'n impak het op die skubaduikbedryf in die Oos-Afrika Mariene Ekostreek

OPSOMMING

Skubaduik is 'n gewilde mariene ontspanningsaktiwiteit langs die oos- en suidkus van Afrika. Hierdie streek staan bekend as die Oos-Afrika Mariene Ekostreek (East African Marine Ecoregion, EAME) en is bekend vir sy rykheid aan mariene fauna en flora, insluitende sommige van die Indiese Oseaan se mees diverse en welige koraalrif-ekostelsels, wat dit 'n gewilde bestemming vir skubaduikers maak.

Die toekoms van die skubaduikbedryf word bedreig weens die impak van omgewings-, sosiale, politieke en ekonomiese gebeure, en daar is 'n behoefte om beter te verstaan hoe hierdie eksterne risiko's skubaduiktoerisme-besighede in die EAME beïnvloed. Empiriese bewyse suggereer dat eksterne risiko's, internasionaal sowel as plaaslik, 'n invloed op die toerismebedryf as 'n geheel het. Beperkte navorsing is egter gedoen oor die impak van sulke eksterne risiko's op spesifiek die duiktoerisme-bedryf. Bestaande navorsing het ook uitvoerig gefokus op omgewingsrisiko's eerder as hoe eksterne risiko's van 'n politieke, ekonomiese en sosiale aard duik-Operateur-volhoubaarheid in die EAME beïnvloed. Die meeste studies het ook gefokus op die aanvraagkant (duikers) in teenstelling met die aanbodkant (duik-Operateurs). Verder, omdat duiktoeriste meer buigsaamheid het om hulle bestemming te verander indien risiko's voorkom, bedreig dit die sukses van duik-Operateurs in hoë-risiko-gebiede.

Om hierdie probleme te hanteer is die primêre doel van die navorsing wat gedoen is om op omvattende wyse die impak van eksterne risiko's (omgewing, ekonomies, sosiaal en polities) op duik-Operateurs in vier lande in die EAME te identifiseer uit 'n aanbodkant-perspektief. Om die primêre doelwit te behaal, is die volgende sekondêre doelwitte bereik:

1. Skubaduik-toerisme-Operateurs in die EAME en hulle operasionele omvang is geïdentifiseer.
2. Die eksterne risiko's wat die relevantste vir duik-Operateurs in die EAME is, is bepaal en hulle vlak van impak is geassesseer.
3. Die individuele eksterne risiko's wat deur elkeen van die lande in die EAME (Kenia, Tanzanië, Mosambiek en Suid-Afrika) ervaar is, is vergelyk deur die gebruik van 'n

kruisgeval-analise.

4. Die persepsie van duik-operateurs wat betref of eksterne risiko's 'n duiktoeris se besluit sal beïnvloed om na die duik-Operateur se operasionele gebied in die EAME te reis, is geassesseer.

Die studie het uit twee fases bestaan. Fase 1 het gestruktureerde onderhoude met 'n geselekteerde groep duik-operateurs behels om insig te kry in die eksterne risiko's wat die algemeenste in die skubaduikbedryf voorkom, en om te help om 'n kwantitatiewe gestruktureerde peiling (fase 2) te ontwikkel, wat gevolglik deur duik-operateurs in Kenia, Tanzanië, Mosambiek en Suid-Afrika voltooi is. Data is ingevoer in SPSS vir kwantitatiewe statistiese analise.

Uit die primêre data wat ingesamel is, het die belangrikste bevindings van hierdie studie bepaal dat die huidige ekonomiese en politieke risiko's die grootste impak op duik-operateurs in die EAME het, en daar word verwag dat hierdie tendens sal voortduur. Die omgewingsagteruitgang van koraalriwwe, hoewel dit nie tans as 'n bedreiging beskou word nie, is 'n sleutelbedreiging vir die nabye toekoms. Die grootste invloede wat uitgedruk is as risiko-kategorieë wat 'n invloed op duiktoerisme het, is plaaslike ekonomiese risiko's, internasionale ekonomiese risiko's, plaaslike politieke risiko's en internasionale politieke risiko's. 'n Kruisgeval-analise wat op die vier lande uitgevoer is, het bevind dat eksterne risiko's wisselende uitwerkings binne die verskillende lande het. Laastens het die resultate aangedui dat eksterne risiko's 'n duiktoeris se besluit om na die EAME te reis, aansienlik beïnvloed.

Deur die eksterne risiko's te identifiseer en te assesseer wat 'n impak op duik-operateurs in die EAME het, dra hierdie navorsing by tot kennis oor die duiktoerismebedryf in die EAME, asook duiktoerisme verder weg en die wyer veld van toerismebestuur. Die studie se bevindings skep 'n bewustheid van die uitwerking wat eksterne risiko's op duik-operateurs in die streek het. 'n Konseptuele raamwerk is ontwikkel wat eksterne risiko's in die skubaduikbedryf omvat. Risiko-radars, risiko-kaarte en tabelle wat volgens kleur gekodeer is, was verdere uitsette van hierdie studie wat besighede, die gemeenskap en ekonomieë kan help om te reageer op huidige en toekomstige bedreigings en krisisse op 'n meer ingeligte en intuïtiewe manier. Dit kan bereik word deur risikobestuurstrategieë te implementeer om blootstelling aan eksterne risiko's te mitigeer of te verminder; belanghebbertebetrokkenheid op die toerismewaardeketting te versterk; en om die behoefte vir regeringsbetrokkenheid by die

beskerming van die omgewing en bevordering van kleinbesigheids groei in die streek te beklemtoon. Toekomstige navorsing kan 'n wyer oorsig van die mariene toerismebedryf en ander areas van die Blou Ekonomie insluit.

Slutel terme: skubaduik, skubaduiktoerisme, skubaduikbedryf, mariene toerisme, koraalriftoerisme, volhoubare toerisme, Oos-Afrika Mariene Ekostreek (EAME), eksterne risiko's, internasionale risiko's, plaaslike risiko's, omgewingsrisiko's, ekonomiese risiko's, sosiale risiko's, politieke risiko's

Dikotsi tsa kantle tse amang ho sesa tlasa lewatle lebatoweng la Afrika Botjhabela

KGUTSUFATSO

Ho sesa tlasa metsi a lewatle ke mosebetsi o tsebahalang haholo wa boithabiso ba lewatle haufi le mabopo a ka botjhabela le borwa ba Afrika. Sebaka sena se kgethollwa e le lefatshe la bophelo ba mawatle a Afrika Botjhabela (EAME) mme se tsejwa ka leruo la sona la diphoofole tsa lewatle le dimela, ho kenyetsetsa le tse ding tsa diphedi tse fapaneng tsa lewatle la Indian, e leng se etsang hore e be sebaka se tumeng bakeng sa batho ba sesang tlasa lewatle.

Bokamoso ba indasteri ya ho tola tlasa lewatle bo kotsing ka lebaka la tshusumetso ya tikoloho, kahisano, dipolotiki le moruo, mme ho na le tlhokahalo ya ho utlwisisa hantle hore dikotsi tse tsa kantle di ama jwang dikgwebo tsa bothori bo amanang le ho sesa tlasa lewatle EAME (Mabatoweng a Afrika Botjhabela a diphedi tsa mawatle). Bopaki bo hlakileng bo fana ka maikutlo a hore dikotsi tsa kantle, tsa matjhaba le tsa lehae, di na le tshwaetso indastering ya bohahlauhi ka kakaretso. Leha ho le jwalo, dipatlisiso tse fokolang di ile tsa etswa mabapi le sefutho sa dikotsi tse jwalo tsa kantle indastering ea bohahlauhi ba ho sesa ka ho kgetheha. Dipatlisiso tse teng di boetse di tsepamisitse maikutlo haholo ka dikotsi tsa tikoloho di sa shebe hore na dikotsi tsa kantle tsa dipolotiki, tsa moruo le tsa kahisano di ama jwang ho tsitsisa tshebetso ho EAME. Diphuputso tse ngata di boetse di tsepame lehlakoreng la tlhokahalo (disehi) ho fapana le lehlakore la diphallelo (batho ba sesang). Ho phaella moo, jwalo ka ha disehi tsa bahahlauhi di ena le maemo a mangata a ho fetola dibaka tsa bona ha ho hlaha dikotsi, sena se senya katleho ya disehi dibakeng tse nang le dikotsi tse ngatanyana.

Ho rarolla mathata ana, sepheo se ka sehloohong sa dipatlisiso tse entsweng di ile tsa leka ho lemoha ka ho hlaka sefutho sa dikotsi tsa kantle (tikoloho, moruo, kahisano le dipolotiki) ho disehi dinaheng tse nne tse ka hare ho EAME ho tloha lehlakoreng la phepele. E le ho finyella sepheo se ka sehloohong, dipheo tse latelang di ile tsa fihlellwa:

1. Ho kgetholla basebeletsi ba bahahlauhi ba ho sesa lebatoweng la EAME le tsela ya tshebetso ya bona.
2. Ho etsa qeto ya dikotsi tse ka ntle tsa bohlokwa ho tsamaisa ba disehi ho EAME le

ho hlaloha boemo ba tsona ba tshusumetso.

3. Ho bapiswa dikotsi tse ka ntle tsa naha ka nngwe ho EAME (Kenya, Tanzania, Mozambique le Afrika Borwa) ho sebedisa dintlha tsa ho hlaloha diketsahalo.
4. Hlahloba maikutlo a disesi mabapi le hore na dikotsi tse ka ntle di tla susumetsa qeto ya bahahlaudi ba ho etela sebakeng seo ba sebetsang ho sona ho EAME

Thuto e ne e ena le mekgahlelo e mmedi. Mokgahlelo wa 1 o ne o ena le dipuisano tse hlophisitsweng le sehlopha se kgethilweng sa basebetsi ba disesi ho utlwisisa dikotsi tse ka ntle tse atileng haholo indastering ya ho sesa, le ho thusa ho ntlafatsa tlhahlobo e entsweng ka bongata (Phase 2), e ileng ya qetella e phethilwe ke basebetsi ba disesi Kenya, Tanzania, Mozambique le Afrika Borwa. Lesedi le ile la kenngwa ka SPSS bakeng sa tlhahlobo ya dipalopalo.

Ho tswa leseding la motheho le bokelletsweng, diphuputso tse kgolo tsa thuto ena di bontshitse hore dikotsi tsa moraora o tsa moruo le tsa lipolotiki di na le tshusumetso e kgolo ho ba sebetsang e le basebetsi ba disesi EAME, mme mokgwa ona o lebeletswe hore o tswele pele. Ho senyeha ha tikoloho ya dimela/diphedi tsa lewatele, ha ho sa nkuweng e le tshoso hona jwale, ke tshoso e ka sehloohong bakeng sa nako e tlang. Tshusumetso e matla ka ho fetisisa e hlahositsweng ka mekgahlelo ya dikotsi tse amang tsela ya ho etela dibaka tsa bohahlaudi ke dikotsi tsa moruo wa lehae, dikotsi tsa matjhaba tsa moruo, dikotsi tsa dipolotiki tsa lehae le dikotsi tsa matjhaba tsa dipolotiki. Phuputso e entsweng dinaheng tse nne e qetile ka hore dikotsi tsa ka ntle di na le diphello tse fapaneng dinaheng tse fapaneng. Qetellong, diphello di bontshitse hore dikotsi tsa ka ntle di susumetsa haholo qeto ya mohahlaudi wa ya sesang tlasa lewatele ho etela EAME.

Ka ho kgetholla le ho hlaloha dikotsi tse ka ntle tse nang le tshwaetso basebetsing ba disesi EAME, dipatlisiso tsena di tlatsetsa tsebong lefapheng la bohahlaudi ba ho ho sesa tlasa lewatele dibakeng tsa EAME, ha mmoho le bahahlaudi ba ho sesa ka ho phatlalla tsamaisong ya bohahlaudi. Diphuputso tsa thuto di etsa hore ho be le tlhokomediso ya phello ya ka moo dikotsi tse ka ntle di nang le kameho disesing sebakeng seo. Ho na le moralo o ileng wa etswa o kenyetsang dikotsi tsa kantle indastering ya ho sesa tlasa lewatele. Diwaelese tse nkgellang dikotsi, dimmapa tsa dikotsi le ditafole tse nang le mebala di ne di boetse di hlahisa thuto ena e ka thusang dikgwebo, setjhaba le moruo ho arabela dikotsing tsa moraora o tsa nakong e tlang ka ditsela tse rutang le tse nang le tsebo. Sena se ka fihlellwa ka ho kenya tshebetsong maano a tsamaiso ya kotsi bakeng sa ho fokotsa ho pepeseha dikotsing tsa kantle;

ho matlafatsa tshebetsong ya bankaseabo motjheng wa bohlokwa wa bohahlaudi; le ho totobatsa tlhokahalo ya ho nka seabo ha mmuso ho sireletsa tikoloho le tshehetso ya kgolo ya dikgwebo tse nyenyane sebakeng seo. Phuputso ya nako e tlang e ka kenyelletsa pono e pharaletseng ya indasteri ya bahahlaudi ba lewatele le dibaka tse ding tsa Blue Economy.

Mantswe a sehlooho: Ho sesa tlasa lewatele, bohahlaudi ba ho sesa tlasa lewatele, indasteri ya ho sesa, bohahlaudi ba mawatle, bohahlauli ba dimela/diphedi tsa lewatele, bohahlaudi bo tsitsitseng, lebatowa la Afrika Botjhabela la diphedi tsa lewatele (EAME), dikotsi tsa kante, dikotsi tsa matjhaba, dikotsi tsa lehae, dikotsi tsa tikoloho, dikotsi tsa moruo, dikotsi tsa phedisano, dikotsi tsa dipolotiki.

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To the dive operators located along the length of the east African coast, who contributed their time to participate in the interviews, and share their many years of knowledge and experience of the scuba diving industry.

I dedicate this dissertation to my late nephew, Nicholas Papadimos, aged 16, whose memory kept encouraging and motivating me to continue on to complete my dissertation and make a contribution to a field of study that he was overwhelmingly passionate about.

DECLARATION

I declare that this Master's dissertation, which I hereby submit for the degree MCom (Tourism Management) at the University of South Africa, is my own work and has not previously been submitted by me for a degree at another university.

Date: _____

Signature: _____

LIST OF ACRONYMS AND ABBREVIATIONS

EAME	East African Marine Ecoregion
EEZ	Exclusive economic zone
EFA	Exploratory factor analysis
GDP	Gross domestic product
IPCC	Intergovernmental Panel on Climate Change
KWS	Kenya Wildlife Service
MPA	Marine protected area
MRA	Marine recreational activity
NGO	Non-governmental organisation
PADI	Professional Association of Dive Instructors
SCUBA	Self-contained underwater breathing apparatus
SDT	Scuba diving tourism
SDTS	Scuba diving tourism system
SIT	Special interest tourism
SMEs	Small and medium enterprises
SPSS	Statistical Package for the Social Sciences
UNWTO	United Nations World Tourism Organisation
WIO	Western Indian Ocean
WTTC	World Travel and Tourism Council

Acronyms for Risk Categories

DER	Direct environmental risks
IER	Indirect environmental risks
DEcR	Domestic economic risks
IEcR	International economic risks
DSR	Domestic social risks
ISR	International social risks
DPR	Domestic political risks
IPR	International political risks

TABLE OF CONTENTS

ABSTRACT	i
ACKNOWLEDGEMENTS	ix
DECLARATION	x
LIST OF ACRONYMS AND ABBREVIATIONS	xi
Table of contents	xii
List of figures	xvii
List of tables	xx
CHAPTER 1	1
INTRODUCTION.....	1
1.1. BACKGROUND TO THE STUDY	1
1.2. RESEARCH PROBLEM.....	4
1.3. RESEARCH OBJECTIVES	8
1.3.1. Primary research objective.....	8
1.3.2. Secondary research objectives	8
1.4. RESEARCH DESIGN AND METHODOLOGY	8
1.4.1. Secondary Research.....	9
1.4.2. Primary Research.....	9
1.5. KEY CONCEPTS.....	12
1.5.1. Marine tourism.....	12
1.5.2. Scuba diving tourism	13
1.5.3. The East African Marine Eco-region (EAME).....	13
1.5.4. Coral reefs.....	14
1.5.5. Marine Protected Areas (MPA's)	15
1.5.6. External risks	15
1.6. STRUCTURE OF THE DISSERTATION.....	16
CHAPTER 2	18
SCUBA DIVING TOURISM IN THE EAST AFRICAN MARINE ECOREGION (EAME)	18
2.1. INTRODUCTION	18
2.2. SCUBA DIVING TOURISM	21
2.2.1. Coral reefs and dive tourism	22
2.2.2. Destination image and attractions	23
2.2.3. Diver demographics	24
2.2.4. Economic value of coral reefs	24
2.2.5. The Scuba Diving Tourism System (SDTS).....	26
2.3. SCUBA DIVING TOURISM IN THE EAST AFRICAN MARINE ECOREGION (EAME)	29
2.3.1. Tourism growth in the EAME	29
2.3.2. Dive tourism hotspots in the EAME	30
2.3.3. Coral reef distribution in the EAME.....	32
2.3.3.1. Kenya.....	33
2.3.3.2. Tanzania.....	35
2.3.3.3. Mozambique	38
2.3.3.4. South Africa.....	42
2.3.4. Coral reef morphology in the EAME.....	43
2.4. CONCLUSION.....	44

CHAPTER 3	46
OVERVIEW OF EXTERNAL RISKS IN THE SCUBA DIVING INDUSTRY	46
3.1. INTRODUCTION	46
3.2. DEFINING EXTERNAL RISKS IN THE CONTEXT OF THE SCUBA DIVING INDUSTRY	48
3.3. EXTERNAL RISKS FRAMEWORK FOR THE SCUBA DIVING INDUSTRY	49
3.4. DOMESTIC EXTERNAL RISKS.....	51
3.4.1. DIRECT ENVIRONMENTAL RISKS	51
3.4.1.1. Coral damage	53
3.4.1.2. Extraction of marine resources	56
3.4.1.3. Marine pollution	59
3.4.2. DOMESTIC ECONOMIC RISKS	61
3.4.2.1. Increasing prices	62
3.4.2.2. Depressed local economic activity.....	64
3.4.2.3. Economic impact of coral reef degradation	66
3.4.3. DOMESTIC SOCIAL RISKS	67
3.4.3.1. Local health and disease epidemics	67
3.4.3.2. Population growth.....	69
3.4.3.3. Crime	71
3.4.4. DOMESTIC POLITICAL RISKS	72
3.4.4.1. Political instability	73
3.4.4.2. Government corruption.....	75
3.4.4.3. Marine protected area (MPA) regulations	76
3.5. INTERNATIONAL EXTERNAL RISKS	81
3.5.1. INDIRECT ENVIRONMENTAL RISKS	81
3.5.1.1. Climate change and coral reefs	82
3.5.1.2. Industrialisation of coastal regions	87
3.5.1.3. Increased shipping and boating.....	88
3.5.1.4. Marine pollution: land-based pollutants, micro-plastics and floating marine debris	88
3.5.2. INTERNATIONAL ECONOMIC RISKS	90
3.5.2.1. Economic recessions	91
3.5.2.2. Price competitiveness	91
3.5.2.3. Dive tourist accessibility.....	93
3.5.3. INTERNATIONAL SOCIAL RISKS	94
3.5.3.1. Global disease epidemics	95
3.5.3.2. International crime	96
3.5.3.3. Coastal migration.....	98
3.5.4. INTERNATIONAL POLITICAL RISKS	99
3.5.4.1. Regional political instability	99
3.5.4.2. Travel restrictions	101
3.6. CONCLUSION.....	103
CHAPTER 4	104
RESEARCH DESIGN AND METHODOLOGY	104
4.1. INTRODUCTION	104
4.2. PHASES OF THE RESEARCH	105
4.3. STUDY SITES	105
4.4. RESEARCH DESIGN	107
4.4.1. Research paradigm.....	107

4.4.2.	Nature of the study.....	107
4.4.3.	Selection of research design	107
4.5.	SAMPLING PLAN	109
4.5.1.	Define the population	109
4.5.2.	Determine the sample size	110
4.5.3.	Select a sampling method	112
4.5.4.	Survey response rate	112
4.6.	RESEARCH ETHICS	113
4.7.	RESEARCH INSTRUMENT	114
4.8.	PILOT TESTING	125
4.9.	DATA COLLECTION	126
4.9.1.	Phase 1 - Structured interviews.....	127
4.9.2.	Phase 2 - Structured survey	128
4.10.	DATA PROCESSING.....	130
4.10.1.	Phase 1 – Structured interviews.....	130
4.10.2.	Phase 2 – Structured survey.....	130
4.11.	DATA ANALYSIS	130
4.11.1.	Data types	130
4.11.2.	Validity and reliability	131
4.12.	PRESENTATION OF RESEARCH FINDINGS	135
4.13.	CONCLUSION.....	135
CHAPTER 5	137
ANALYSIS OF DATA AND DISCUSSION OF RESULTS	137
5.1.	INTRODUCTION	137
PART A	140
5.2.	BIOGRAPHICAL INFORMATION.....	140
5.2.1.	Dive operators in the EAME	140
5.2.2.	Number of years in operation	142
5.2.3.	Income generated from scuba diving activities.....	142
5.2.4.	Scuba diving activities that occur on coral reefs.....	143
5.2.5.	Dive operations within or near to marine protected areas (MPAs) and marine reserves	144
5.2.6.	Dive tourists’ country of origin	144
5.3.	OVERALL RESULTS AND RANKING OF EXTERNAL RISKS	145
5.3.1.	Direct environmental risks (DER)	146
5.3.2.	Indirect environmental risks (IER)	148
5.3.3.	Coral reef degradation occurrence	149
5.3.4.	Coral reef degradation and business continuity	149
5.3.5.	Direct economic risks (DEcR)	150
5.3.6.	International economic risks (IEcR)	151
5.3.7.	Domestic social risks (DSR)	152
5.3.8.	International social risks (ISR)	152
5.3.9.	Domestic political risks (DPR)	153
5.3.10.	International political risks (IPR).....	154
5.4.	DIVE TOURIST DECISIONS	155
5.5.	GREATEST IMPACTS ON DIVE OPERATORS	157
5.5.1.	Highest risk categories currently	157
5.5.2.	Highest risk categories in future	157
5.6.	ADAPTATION STRATEGIES.....	158
5.7.	EXPLORATORY FACTOR ANALYSIS (EFA).....	160

5.7.1.	Direct environmental risks (DER)	162
5.7.2.	Indirect environmental risks (IER)	162
5.7.3.	Domestic economic risks (DEcR).....	163
5.7.4.	Domestic political risks (DPR).....	163
5.8.	CORRELATIONS BETWEEN RISK CATEGORIES	164
5.8.1.	DER significance discussion	165
5.8.2.	IER significance discussion	165
5.8.3.	DEcR significance discussion.....	166
5.8.4.	IEcR significance discussion	166
5.8.5.	DSR significance discussion.....	166
5.8.6.	ISR significance discussion	166
5.8.7.	DPR significance discussion.....	167
5.8.8.	IPR significance discussion	167
5.9.	SUMMARY OF OVERALL RESULTS (PART A)	167
5.9.1.	Biographical information of dive operators	167
5.9.2.	Overall results for risk categories	167
5.9.3.	Environmental risks	169
5.9.4.	Economic risks.....	170
5.9.5.	Social risks.....	170
5.9.6.	Political risks	171
PART B		172
5.10.	CROSS-CASE ANALYSIS OF EXTERNAL RISKS	172
5.10.1.	Direct environmental risks (DER)	174
5.10.2.	Indirect environmental risks (IER)	181
5.10.3.	Domestic economic risks (DEcR).....	185
5.10.4.	International economic risks (IEcR)	190
5.10.5.	Domestic social risks (DSR).....	196
5.10.6.	International social risks (ISR)	201
5.10.7.	Domestic political risks (DPR).....	205
5.10.8.	International political risks (IPR).....	212
5.11.	SUMMARY OF CROSS-CASE ANALYSIS (PART B)	217
5.11.1	Kenya.....	219
5.11.2	Tanzania.....	219
5.11.3	Mozambique	219
5.11.4	South Africa.....	220
5.11.5	Overall conclusion for cross-case analysis	220
5.12.	CONCLUSION.....	221
CHAPTER 6		222
CONCLUSION TO THE STUDY		222
6.1.	INTRODUCTION	222
6.2.	ACHIEVEMENT OF RESEARCH OBJECTIVES	222
6.2.1.	Secondary research objective 1.....	223
6.2.2.	Secondary research objective 2.....	224
6.2.3.	Secondary research objective 3.....	231
6.2.4.	Secondary research objective 4.....	236
6.2.5.	In summary: Achievement of research objectives	236
6.3.	ADDRESSING THE RESEARCH PROBLEM.....	237
6.4.	CONTRIBUTION OF THE RESEARCH.....	240
6.5.	LIMITATIONS OF THIS STUDY	242
6.6.	SUGGESTIONS FOR FURTHER RESEARCH	242
6.7.	CONCLUSION.....	243
REFERENCES		246

APPENDICES	306
Appendix A: Structured interview schedule.....	306
Appendix B: Structured survey (online web survey)	311
Appendix C: Ethical clearance certificate	332
Appendix D: Rationale for questions asked within structured survey.....	333
Appendix E: Marine protected areas (MPAs) in the EAME	343
Appendix F: Accompanying CD of values	346
Appendix G: United Nations Sustainable Development Goal 14.....	347
Appendix H: Editor’s letter	348

LIST OF FIGURES

Figure 1.1:	The East African Marine Ecoregion (EAME).....	3
Figure 1.2:	Chapter outline of the dissertation	17
Figure 2.1:	Structure and flow of the literature review.....	19
Figure 2.2:	Structure and flow of Chapter 2	20
Figure 2.3:	Marine ecosystem services.....	25
Figure 2.4:	The Scuba Diving Tourism System (SDTS)	27
Figure 2.5:	Dive tourism hotspots in the EAME	32
Figure 2.6:	Coral reefs along the Kenyan coastline	34
Figure 2.7:	Coral reefs along the northern Tanzanian coastline	36
Figure 2.8:	Coral reefs along southern Tanzania.....	38
Figure 2.9:	Coral reefs along northern Mozambique.....	39
Figure 2.10:	Coral reefs along central Mozambique	41
Figure 2.11:	Coral reefs along southern Mozambique.....	42
Figure 2.12:	Coral reefs along north-eastern South Africa.....	43
Figure 2.13:	Diagram of a fringing coral reef.....	44
Figure 3.1:	Structure and flow of Chapter 3	47
Figure 3.2:	Conceptual framework of external risks: flow of domestic and international risks on scuba diving operator businesses	50
Figure 3.3:	Level of coral reef degradation along the coast of East Africa and the Western Indian Ocean (WIO).....	53
Figure 4.1:	Location of dive operators in the EAME	106
Figure 4.2:	A typology of research design types	108
Figure 4.3:	Procedure for selecting a sample.....	109
Figure 4.4:	Types of variables for data analysis	131
Figure 4.5:	Validity and reliability of research instrument.....	132
Figure 5.1:	Structure and flow of Chapter 5	138
Figure 5.2:	Percentage of dive operators' scuba diving activities occurring on coral reefs.....	143
Figure 5.3:	Overall ranking of direct environmental risks.....	147
Figure 5.4:	Ranking for indirect environmental risks.....	148
Figure 5.5:	Ranking for domestic economic risks	150
Figure 5.6:	Ranking for international economic risks	151
Figure 5.7:	Ranking for domestic social risks	152
Figure 5.8:	Ranking for international social risks.....	153
Figure 5.9:	Ranking for domestic political risks.....	154
Figure 5.10:	Ranking for international political risks.....	155
Figure 5.11:	Influence of external risk categories on a dive tourist's decision to travel to a dive destination	156
Figure 5.12:	Risk groups perceived to currently have the highest impact on a dive operator business.....	157
Figure 5.13:	Risk groups perceived to have the greatest impact on a dive operator business in future.....	158

Figure 5.14: Adaptation strategies applied to mitigate external risks	159
Figure 5.15: Overall means by risk category	169
Figure 5.16: Radar diagram for direct environmental risks (DER)	175
Figure 5.17: Overfishing.....	176
Figure 5.18: Marine pollution (marine debris) results	177
Figure 5.19: Destructive fishing	179
Figure 5.20: Tourism overuse: coastal development	180
Figure 5.21: Tourism overuse: diver impacts	181
Figure 5.22: Radar diagram for overall indirect environmental risks (IER).....	182
Figure 5.23: Marine pollution (plastics, marine debris)	183
Figure 5.24: Coral bleaching (SST).....	184
Figure 5.25: Extreme weather events	185
Figure 5.26: Radar diagram for domestic economic risks (DEcR).....	186
Figure 5.27: Price inflation.....	187
Figure 5.28: Depressed local economic activity	188
Figure 5.29: High fuel prices	189
Figure 5.30: Increasing interest rates.....	190
Figure 5.31: Radar diagram for overall international economic risks (IEcR).....	191
Figure 5.32: Economic recessions	192
Figure 5.33: Financial crises.....	193
Figure 5.34: Dive tourist accessibility	194
Figure 5.35: Price competitiveness.....	195
Figure 5.36: High exchange rates	196
Figure 5.37: Radar diagram for overall domestic social risks (DSR)	197
Figure 5.38: Domestic crime	198
Figure 5.39: Population growth along the coast	199
Figure 5.40: Rising unemployment	200
Figure 5.41: Increased dependency on marine resources by communities	201
Figure 5.42: Radar diagram for overall international social risks (ISR).....	202
Figure 5.43: Global disease epidemics	203
Figure 5.44: International crime	204
Figure 5.45: Coastal migration	205
Figure 5.46: Radar diagram for overall domestic political risks (DPR)	206
Figure 5.47: Political instability	207
Figure 5.48: Restrictive government regulations.....	208
Figure 5.49: Lack of service delivery	209
Figure 5.50: Civil unrest and/or strikes	210
Figure 5.51: Government corruption	211
Figure 5.52: Restrictive MPA regulations	212
Figure 5.53: Radar diagram for overall International political risks (IPR).....	213

Figure 5.54: Strict visa regulations	214
Figure 5.55: Travel restrictions	215
Figure 5.56: Regional political instability	216
Figure 5.57: Neighbouring conflicts	217
Figure 6.1: Risk radar for <i>direct</i> environmental risks and <i>domestic</i> economic, social and political risks	229
Figure 6.2: Risk radar for <i>indirect</i> environmental risks and <i>international</i> economic, social and political risks	230
Figure 6.3: Map of the EAME indicating the individual risks per country with high to very high impacts	232

LIST OF TABLES

Table 1.1:	The tourism industry and risk.....	4
Table 1.2:	External risks associated with the tourism industry	5
Table 1.3:	Construction of the structured survey	10
Table 2.1:	International tourist arrivals to countries in the EAME in 2013	30
Table 2.2:	Area of coral reefs and coastal length in East Africa	33
Table 3.1:	Domestic risk categories	51
Table 3.2:	Direct environmental risks	52
Table 3.3:	Domestic economic risks	62
Table 3.4:	Fuel price growth in EAME countries	62
Table 3.5:	Real interest rates in EAME countries	63
Table 3.6:	Consumer Price Index (CPI) for EAME countries	64
Table 3.7:	GDP growth per capita in the EAME.....	65
Table 3.8:	Domestic social risks.....	67
Table 3.9:	Access to improved sanitation in EAME countries.....	69
Table 3.10:	Access to improved drinking water in EAME countries	69
Table 3.11:	Domestic political risks.....	73
Table 3.12:	International risk categories	81
Table 3.13:	Indirect environmental risks.....	82
Table 3.14:	International economic risks	91
Table 3.15:	Exchange rates for EAME countries (2008–2016)	93
Table 3.16:	International social risks	95
Table 3.17:	International political risks.....	99
Table 4.1:	Steps in the primary research process	104
Table 4.2:	Population and recommended sample size of the dive operators in the EAME.....	110
Table 4.3:	Revised population, sample size and actual sample size of the dive operators in the EAME	111
Table 4.4:	Probability and non-probability sampling methods	112
Table 4.5:	Response rate per country and the total responses received.....	113
Table 4.6:	Shaping of the structured survey from Phase 1	116
Table 4.7:	Research objectives aligned to sections in the structured survey	124
Table 4.8:	Dive operators selected for structured interviews based on years in operation.....	128
Table 4.9:	Types of variables applied to the structured survey	131
Table 5.1:	Mapping of research objectives to the analysis of findings.....	139
Table 5.2:	Dive operators in the EAME by country broken down by region.....	141
Table 5.3:	Numbers of years dive operators have been in operation.....	142
Table 5.4:	Percentage of income generated by scuba diving activities	143
Table 5.5:	Origin of dive tourists by region	145
Table 5.6:	Descriptive statistics between external risk constructs.....	146
Table 5.7:	Coral reef degradation occurrence	149

Table 5.8:	Coral reef degradation and business continuity.....	150
Table 5.9:	Factors identified by exploratory factor analysis (EFA)	161
Table 5.10:	Direct environmental risk (DER) factors	162
Table 5.11:	Indirect environmental risk (IER) factors	163
Table 5.12:	Domestic economic risk (DEcR) factors.....	163
Table 5.13:	Domestic political risk (DPR) factors	164
Table 5.14:	Kendall's tau_b test (τ) for non-parametric correlations	165
Table 5.15:	Overall mean for external risk category groups	168
Table 5.16:	Comparison of domestic and international risks	168
Table 5.17:	Kruskal-Wallis test by risk category per country in the EAME.....	172
Table 5.18:	Colour coding responses of external risks to assist in the interpretation of results	174
Table 5.19:	Overall mean results of external risk categories by country comparison	218
Table 6.1:	Colour coding responses of external risks to assist in the interpretation of results	226
Table 6.2:	Highest risk category mean scores by country comparison	226

CHAPTER 1

INTRODUCTION

1.1. BACKGROUND TO THE STUDY

Scuba diving has been identified as one of the world's fastest growing adventure sports (Hall, 2013; Lew, 2013; Mograbi and Rogerson, 2007; Musa and Dimmock, 2012; Olson, Dinerstein, Wikramanayake, Burgess, Powell, Underwood et al., 2001; Ong and Musa, 2011; Tabata, 1992), recording high annual growth rates of 14% (PADI, 2014; 2017a; Piskurek, 2001) in the adventure tourism sector (Buckley 2006; Shephard and Evans, 2005; Swarbrooke, Beard, Leckie, and Pomfret, 2003), and is one of the key components of coral reef tourism and recreation (Becken and Hay, 2007; Christ, Hillel, Matus and Sweeting, 2003; Spalding, Burke, Wood, Ashpole, Hutchison and Ermgassen, 2017). When choosing a dive destination, divers generally look for high-quality coral reef habitats, rich coral and fish diversity, an ocean with high visibility free of pollution and sediment, and resort style retreats (Dimmock, 2003). Every year, millions of scuba divers and snorkelers visit coral reefs to enjoy their abundant sea life (Daldeniz and Hampton, 2011) and local economies receive billions of dollars from these visitors to reef regions through diving tours, recreational fishing trips, hotels, resorts, craft markets and supporting businesses based near coral reef ecosystems (Craig-Smith, Tapper and Font, 2006; Mograbi and Rogerson, 2007).

Ever since SCUBA (Self-Contained Underwater Breathing Apparatus) was developed by Jacques Cousteau and Émile Gagnan in the early 1940s (Garrod and Gössling, 2008), the sport has, over the past seven decades, transformed the underwater experiences of divers in the world's oceans, coral reefs, lakes, mangroves, estuaries and rivers systems (Dimmock, 2007; Garrod, 2008) and earned its place as a “globally recognised form of marine-based leisure and tourism” (Musa and Dimmock, 2012:1). Over this time, scuba diving has grown in popularity from being a sport pursued by hardy adventurers to being featured as a holiday activity or leisure pastime in tropical, subtropical and temperate locations (Musa and Dimmock, 2012). Among the factors that contribute to the appeal and popularity of recreational scuba diving has been the development of safe and affordable diving equipment (Davis and Tisdell, 1995), technological advances that enable marine craft to access remote scuba diving sites more easily (Parker, 2001), and a growing interest in learning about and experiencing ocean environments (Dimmock, 2009; Harriott, Davis and Banks, 1997).

Coral reef tourism is of growing importance worldwide, generating significant economic benefits in many of Africa's coastal tropical destinations (Burke, Reytar, Spalding and Perry, 2011; Muthiga, Costa, Motta, Muhando, Mwaipopo and Schleyer, 2008; Obura, 2005a; Spalding et al., 2017). Scuba diving is centred on coral reef tourism which includes travel to marine parks and wilderness areas, typically in remote areas of developing countries where a large proportion of the world's biodiversity is concentrated (Christ et al., 2003; Spalding et al., 2017). It is therefore not surprising that scuba diving is a popular adventure sport along the east coast of Africa.

The East African Marine Ecoregion (EAME) is an area along the East African coastline that extends over 4 600 kilometres, and includes the territorial waters of Somalia, Kenya, Tanzania, Mozambique and Sodwana Bay in South Africa (Obura, 2005a). The coastline of the EAME comprises the major coral reef systems along the coast of East Africa, which include the patchy reefs of northern Kenya and Somalia (500 km) and the narrow fringing coral reefs of central and southern Kenya and its islands further north (200 km); northern, central and southern Tanzania and its islands (800 km); northern and central Mozambique, and its islands (1 500 km) and the smaller isolated reefs along the southern Mozambique coast (500 km) down to the northern-eastern coast of South Africa (150 km) (ASCLME, 2012; Obura, 2005a).

The EAME supports a great diversity of plant and animal life, including some of the Indian Ocean's most diverse coral reefs, mangrove forests, sand dunes, seagrass beds, and globally significant marine and coastal habitats, and forms a key component of the scuba diving industry in the region (Obura, 2001; Oglethorpe, 2009; WWF, 2015). The species diversity of the ecoregion is very high, making it a prime destination for marine-based tourism along the eastern and southern coastlines of Africa (Burke et al., 2011; EAME, 2004; Musa and Dimmock, 2013; Richmond, 2011; WWF, 2015). The EAME thus forms the geographical range of this study. However, as no dive operators exist in Somalia, only Kenya, Tanzania, Mozambique and South Africa are considered within the scope of this study.

Figure 1.1 illustrates the East African coast, highlighting the fringing coral reefs of the EAME extending from latitude 10° north in Somalia to 28° south in South Africa.

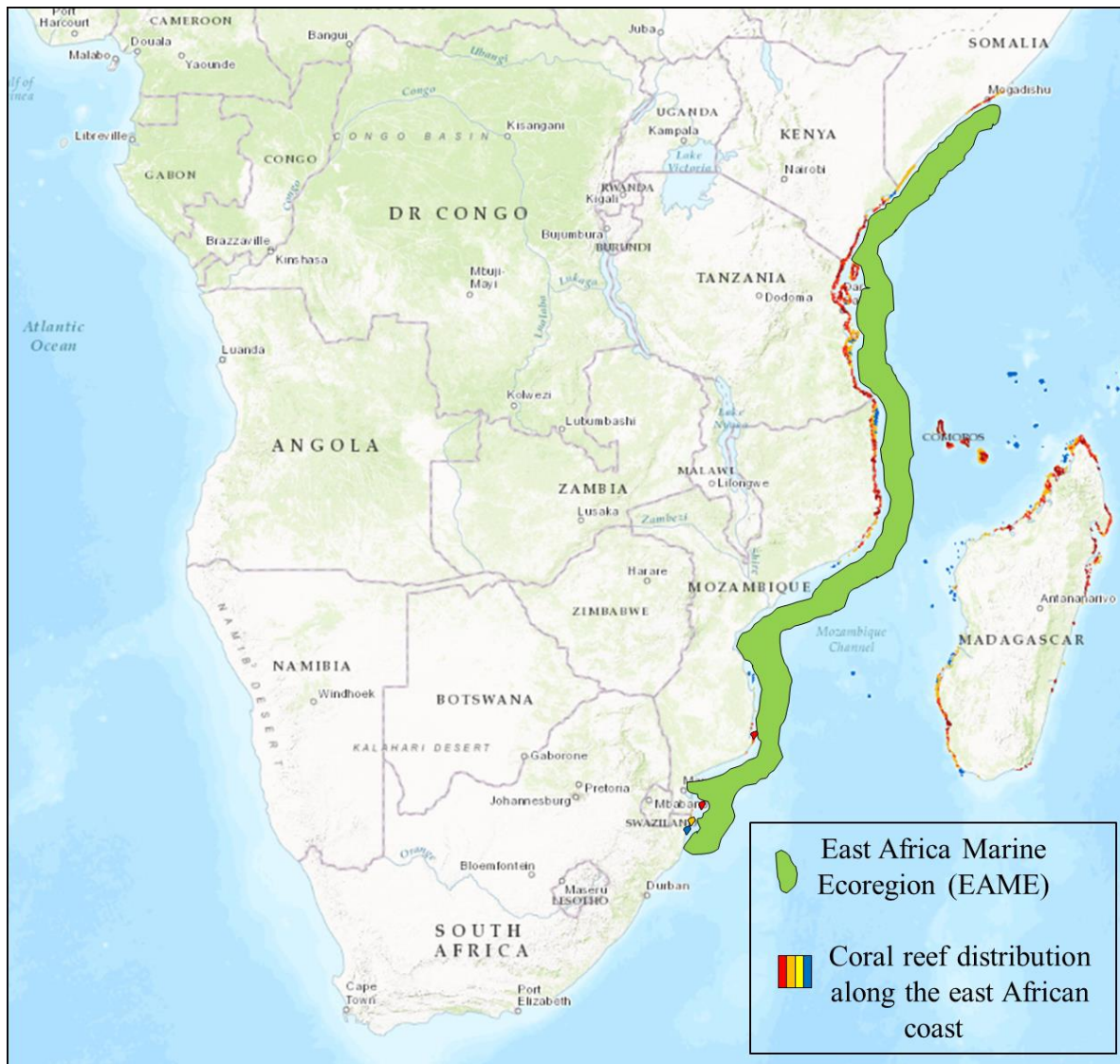


Figure 1.1: The East African Marine Ecoregion (EAME)

Source: Adapted from the Global Conservation Program (Burke et al., 2011; EAME, 2004; Obura, 2005a; Oglethorpe, 2009).

Scuba diving tourism¹ is an economically important industry evidenced by the “number of locations promoting their marine resources in efforts to become scuba diving destinations and diving hotspots” (Dimmock and Musa, 2015:52). The importance of scuba diving tourism cannot be underestimated in tourism management, specifically in the coastal tropical and sub-tropical regions of the world and especially in developing countries which are largely dependent on foreign investment through tourism activities (Burke et al., 2011). Healthy coral reefs provide a rich and diverse array of ecosystem services for the people and the economies of tropical coastal nations. Overall, around the world, coral reefs supply many

¹ Scuba diving tourism is a form of marine tourism and will be referred to as dive tourism or the dive tourism industry throughout this dissertation.

millions of people with food, income and employment and contribute significant export and tourism revenues to national economies (Burke et al., 2011). In addition, coral reefs perform important functions such as protecting shorelines through the formation of beaches, acting as havens for a variety of species of marine life and holding significant cultural value for coastal communities (Burke et al., 2011; Richmond, 2011). Reef ecosystems and their marine resources are therefore critically important to the scuba diving industry, as well as the livelihoods and well-being of local communities (Burke et al., 2011; Musa and Dimmock, 2013).

1.2. RESEARCH PROBLEM

The current financial and economic volatility of the world economy (resulting from the recent financial crises, fluctuating prices in the commodity sectors and fluctuating exchange rates), coupled with the socioeconomic and geopolitical impacts (political instability, rising poverty, rising health issues) and growing environmental change (degradation and exploitation of marine resources), has had a significant impact on the tourism industry (Burgoyne, Kelso and Mearns, 2018; Henderson, 2007; Kuenzi and McNeely, 2012; Shaw, Saayman and Saayman, 2012; Shaw, 2010; WEF, 2013; 2017; Wilks, Pendegast and Leggat, 2006).

Table 1.1: The tourism industry and risk

Topic related to tourism risks	Reference
Risk tolerance, resilience and avoidance	Biggs, Hall, and Stoeckl (2012); Brealey and Myers (2000); Butler and Russell (2010); Gray and Wilson (2009); Kim and Richardson (2003); Nicolau (2008); Ritchie (2004); Silva, Reis and Correia (2010); Tyrell and Johnston, (2007); Walker and Salt (2006); Williams and Baláz (2013)
Risk and adventure tourism	Bentley and Page (2008); Elsrud (2001); Ewert (1989); Pizam, Jeong, Reichel, Boemmel, Lusson, Steynberg, State-Costache, Volo, Kroesbacher, Kucerova and Montmany (2004); Williams and Soutar (2009)
External (exogenous) risks	Aramberri and Butler (2005:123); Beirman (2006); Hall and Williams (2008); Lee and Jang (2007); Mistilis and Sheldon (2006); Ritchie (2009); Sharpe (1964); Shaw (2010); Van Horne (1998)
Risk and destination	Björk and Kauppinen-Räsänen (2012); Croucamp and Hind, 2014; Faulkner (2001); Lee and Jang (2007); Ritchie (2004); Williams and Soutar (2009)
Consumers perceptions of tourism risks	Crang (2014); Lowe, Williams, Shaw and Cudworth (2012); Nysveen (2003); Ward and Ostrom (2003)
Tourism risk management	Ateljevic and Doorne (2000); Brealey and Myers (2000); Cohen (2010); Kim and Richardson (2003); Lo, Cheung and Law (2011); Shaw (2010); Wall (2006)

Although the outlook for tourism is positive and it is forecast to contribute to tourism growth (WTTC, 2017), it is evident that risks can negatively affect the economy, society and the environment, thus having an impact on the tourism industry (Kuenzi and McNeely, 2012). This is substantiated by various authors whose writings relate to tourism risk, as illustrated in Table 1.1.

Studies have shown that economic recessions, crime and natural disasters have had the greatest impact on the tourism industry in the past (Cabrini, 2013; Shaw et al., 2012), and recently, disease pandemics and political instability have come into the spotlight as the main contributors to travel and tourism risks (Booth, 2015; WTTC, 2017). These are known as external or exogenous risks, and various authors have specifically highlighted their impact on the tourism industry. These external risks are classified into risk groups, as shown in Table 1.2.

Table 1.2: External risks associated with the tourism industry

Risk group	Reference
Environmental risks	Becken (2013); Burke et al., 2011; Lo et al., (2011); Swarbrooke et al., (2003); Williams (2013)
Economic risks	Cohen (2010); Kingkan (2012); Kozak, Crotts, and Law (2007); Lee and Jang (2007); Williams and Shaw (2011)
Social risks	Cartwright (2000); Lepp and Gibson (2008); Poon and Adams (2000); Quintal, Lee and Soutar (2010); Schillmeier (2008)
Political risks	Lee and Jang (2007); Sharpe (1964); Rudolph (2003); Sönmez and Graefe (1998); Van Horne (1998)

While these studies relate to external risks worldwide, recent political and economic events have highlighted the risks faced by the tourism economy in Africa. Although travel demand to Africa is projected to double in the next 20 years (WTTC, 2015b; UNWTO, 2015a), according to research conducted by Price Waterhouse Coopers (PWC, 2015; 2017), there has been an alarming decline in the number of tourists to Africa recently as a result of various domestic and regional threats.

In southern and eastern Africa, and the surrounding island nations of the Western Indian Ocean (WIO) specifically, the tourism industry has come under pressure as a result of increased international risks, for example terrorism, rising oil prices, depressed economic activity and the recent 2015/2016 El Niño event (AIMS, 2016; BBC Report, 2015; Booth, 2015; Groenewald, 2013; PGI, 2015; PWC. 2013; 2015; Song, 2011; Tourism Update, 2015;

Wexler, 2015; World Bank, 2015). A recent survey conducted in 2014 of more than 500 safari operators by Safaribookings.com found that they had experienced overall reductions of 20 to 70% when compared to 2013 (Bassetta, 2015). The primary reason given for the sharp decline was “fear of contracting Ebola” (Bassetta, 2015:64).

Similarly, the tourism industry in southern and eastern Africa has been affected by domestic risks, such as crime and safety, political instability, health, over-utilisation of marine resources and environmental degradation (*Business Daily*, 2015; Floros, Schleyer, and Maggs, 2013; Kutengule, 2015; Manning, 2016; Morisset, 2015; O’Leary, and McClanahan, 2011; Silva, 2006; Times Live, 2015; World Bank, 2016b). Therefore, the state of the tourism industry along the EAME is currently being affected by growing international and domestic external risks (Cabrini, 2013). Moreover, Africa’s ‘Blue Economy’ has recently been at the forefront of discussion, signifying that more research needs to be done to identify the focus areas for growth given present risks in the region (African Union, 2012; Smith-Godfrey, 2016; United Nations Economic Commission for Africa. 2016; Van Wyk, 2015).

Scuba diving tourism is one of the key components of marine and coral reef tourism in the EAME (ASCLME, 2012; Orams and Lück, 2014; Spalding et al., 2017), and research suggests the presence of risks that are having both a direct and indirect impact on the future of the scuba diving industry and, more specifically, on dive operators’ businesses (Burke et al., 2011; Dimmock and Musa, 2015).

Cabrini (2013) indicates that regional knowledge gaps exist when assessing the marine tourism industry in Africa. Having considered the existing literature, the following research gaps have been identified:

1. While scuba diving continues to be one of the most popular marine recreational areas (MRAs) in the marine and coral reef tourism industries, its future has come under threat as a result of environmental, social, political and economic impacts (Burgoyne et al., 2018; Burke et al., 2011; Canty, 2007; Richmond, 2011). There is therefore a need to better understand the impact that external risks may have on managing scuba diving tourism businesses (Burke et al., 2011).
2. Most research on scuba diving tourism focuses on the environmental effects on tourism destinations, and these have been well documented (Burke et al., 2011; Cesar, Burke and Pet-Soede, 2003; Cisneros-Montemayor and Sumalia, 2010;

Dimmock and Musa, 2015; Garrod and Gössling, 2008; Lemke and Olech, 2011; Musa and Dimmock, 2013). Researchers have thus proposed taking a wider range of economic, environmental and social tourism impacts into account when assessing the tourism industry (Akan, Arslan and Işık, 2007).

3. Additionally, there are a number of studies which focus on the demand side of the tourism industry (such as Honey and Krantz, 2007; Nelson, 2007; Shaw, 2010). However, according to Shaw et al. (2012:193), “very few researchers have investigated risk from the point of view of the supply side” of tourism.
4. With the variety of tourism destinations becoming more accessible worldwide, travelling to places which are less susceptible to uncertainty, instability and risk of harm is a key consideration for tourists when selecting a travel destination (Cyceon, 2015). Therefore, as tourists have a large capacity to adapt to changing environments given their flexibility to substitute the place, timing and type of holiday they wish to experience (Gössling, Scott, Hall, Ceron, and Dubois, 2012), dive operators’ businesses could be adversely affected.

The effect that domestic and international external risks could have on dive operators poses a threat to the sustainability of the scuba diving industry. A holistic analysis of the external risks that have an impact on dive operators’ businesses thus needs to be conducted. The purpose of this study was, therefore, to identify and assess the external risks affecting dive operators in the EAME from the perspective of the supply side of tourism. This study considered a wide range of economic, environmental, political and social risks that affect the scuba diving industry to gain a better understanding of the external risks that prevail when managing scuba diving tourism businesses, as well as to gain insights into the risks present in Africa’s Blue Economy. By developing an understanding of the current external risks that are influencing dive operator businesses, this research is expected to contribute to the sustainability of dive operators in the EAME by raising awareness of both these risks and the need to better manage and mitigate external risks. The value added could be further extended to all dive tourism operators, as well as the scuba diving industry in Africa and around the world. Additionally, this research may contribute to tourism management in terms of the sustainable management of MRAs. Certain aspects of this research may be applicable to other sectors of the tourism industry such as small and medium enterprises (SMEs), travel companies, and the hospitality and transport sectors.

In order to carry out this study, several research objectives have been outlined, which are discussed next.

1.3. RESEARCH OBJECTIVES

The problem statement has clearly illustrated the need to identify and assess the external risks that prevail in the scuba diving industry in the EAME from the perspective of the dive operator. In order to address the problem statement, the following objectives have been set.

1.3.1. Primary research objective

The primary objective of this study was to identify and assess the external risks that have an impact on the scuba diving industry in the East African Marine Ecoregion (EAME).

1.3.2. Secondary research objectives

In order to achieve the primary research objective, the following secondary research objectives were determined:

1. Identify scuba diving tourism operators in the EAME and their scope of operation.
2. Determine the external risks most relevant to dive operators in the EAME and assess their level of impact.
3. Compare the individual external risks experienced by each of the countries in the EAME (Kenya, Tanzania, Mozambique and South Africa) using a cross-case analysis.
4. Assess the perception of dive operators regarding whether external risks would influence a dive tourist's decision to travel to the dive operator's area of operation in the EAME.

1.4. RESEARCH DESIGN AND METHODOLOGY

Chapter 4 addresses the research design and methodology in detail. This section however, briefly outlines the main components of the research design. The research was directed by the collection of data and the resultant analysis and presentation of results. The main sources of information and data collection were the literature study (secondary research) and the empirical research (primary research). These are briefly introduced below.

1.4.1. Secondary Research

The secondary research consisted of a literature review. An extensive review of existing literature was conducted to ensure that the research topic was thoroughly investigated. A range of sources were used including articles, academic dissertations and electronic databases, internet websites, books and journals. The review of published literature established what previous research had been conducted. Chapter 2 reviews the literature from various sources on the marine tourism industry, scuba diving tourism in general and scuba diving tourism in the EAME. Chapter 3 draws from the literature concerning the external risks in the tourism industry, domestic and international risks and risks in the dive tourism industry.

1.4.2. Primary Research

The primary research was conducted with the purpose of collecting data to achieve the primary research objective, with a predominantly quantitative approach being chosen. The primary research consisted of two phases – first was a structured interview while the second (the main phase) included the construction and dissemination of the structured survey.

The structured interview

Structured interviews were conducted with selected dive operators. The aim was to assess the relevance of external risks to dive operators that the researcher had identified in the existing literature, and thus gain further insights. Four structured interviews were conducted in each of the four countries along the east coast of Africa where dive operators are present (i.e. Kenya, Tanzania, Mozambique and South Africa). The four dive operators were selected based on their years of experience and by word of mouth. The structured interviews took place between July and October 2015. These interviews allowed the researcher to ask some open-ended questions, and to interrogate and probe the existing external risks as well as those not previously considered. The findings obtained from these interviews were collated and subsequently assisted in the construction of the structured survey.

The structured survey

Survey research entails obtaining a quantitative description of the trends, attitudes and/or opinions present in a population by studying a sample of that population (Fowler, 2009). The structured survey that was drawn up will be introduced in this chapter under the following

headings: objective of the survey, design of the structured survey, the sampling and survey methods, and the analytical methods (Graziano and Raulin, 2004).

a. Objective of the survey

A structured survey (online web survey), involving a Likert-type scale, was used to collect data from respondents (dive operators) to determine the level of impact of external risks on dive operator businesses. A Likert scale was used involving a descending scale from very high impact (5), high impact (4), moderate impact (3), low impact (2) to no impact (1). The structured survey measured the importance respondents attached to each of the identified external risks. These external risks were grouped under one of four risk categories, namely, environmental, economic, social and political risks. The risk categories were further classified as direct/domestic external risks or indirect/international external risks.

b. Design of the survey

The purpose of the structured survey was to extract primary data. This involved gathering quantitative data using a web survey sent out to dive operators identified along the coast of East Africa. Initially, a review of the relevant literature provided background information for developing questions for the structured interviews. The information collected in the structured interviews was then used as the basis for formulating the primary research instrument, the online web survey (see Appendix B). The tool used to construct this survey was Survey Monkey[®]. The questions included were developed in line with the research objectives and were arranged into 12 sections which worked together to address the research objectives (see Table 1.3).

Table 1.3: Construction of the structured survey

Research objective	Research objective of the study	Section of the structured survey	
1	Identify the scuba diving operators in the EAME and their scope of operation	2-7	Dive operator information
2	Determine the external risks most relevant to dive operators in the EAME and assess their level of impact	8 9 10 11 12	Environmental risks Economic risks Social risks Political risks Risk categories
3	Compare individual external risks experienced by each of the countries in the EAME (Kenya, Tanzania, Mozambique and South Africa) using a cross-case analysis	8 9 10 11 12	Environmental risks Economic risks Social risks Political risks Risk categories
4	Assessed the perception of dive operators regarding whether external risks would influence a dive tourist's decision to travel to the dive operator's area of operation in the EAME	8 9 10 11	Environmental risks Economic risks Social risks Political risks

Biographical information was collected in sections 2 to 7. A Likert scale was used in sections 8 to 11 of the structured survey to indicate the level of impact that dive operators perceived the external risks (by risk category) to have on their dive tourism businesses. Section 12 required the respondents to select one option based on the risk category they perceived to have the highest impact on their dive operations both currently and in the future. They were also asked to indicate the adaptation strategies they had implemented to mitigate external risks to their businesses.

c. Sampling and survey method

The target population was all the dive operators operating along the east coast of Africa. The geographical scope of the population included dive operators who at the time of the study were engaged in scuba diving tourism as their primary business activity, and operated within the coastal zone of the EAME. Survey Monkey[®] was the medium used to distribute the survey to, and collect responses from, all the dive operators identified as operating along the East African coast. Subsequently, the structured survey was sent to 77 respondents using their email addresses, thereby meeting the selection criteria. The period during which the online web survey was conducted was July to September 2016.

d. Analytical methods

Once the responses had been collected on Survey Monkey[®], the raw data was exported using the Microsoft[®] Excel[®].csv format and then entered in the Statistical Package for the Social Sciences (SPSS)[®] program for statistical analysis. As this study was explorative in nature, descriptive statistics (mean, standard deviation) were used to describe the characteristics of the sample. A factor analysis was used to determine whether any meaningful constructs could be established by identifying variables that were more strongly related than others (Field, 2009). Principal axis factoring was used as an extraction method with eigenvalues greater than one, which explains a significant amount of variation in the data, and a rotated factor matrix was applied to determine the factors (Pallant, 2007). Kendall's tau (τ) was used to test the significance of the correlation of the population to measure strength of association (Pallant, 2011). Given the small population size it was also important to measure the statistical significance between the different countries in East Africa against each of the risk categories, allowing for a comparison of scores. This was achieved by running a Kruskal-Wallis test to measure the significance of the variables between countries (Pallant, 2011). Another method of analysis was to assess the internal consistency reliability of the variables

that were considered for measurement as indicators of the underlying constructs (Pallant, 2011). The average of these values was calculated based on Cronbach's alpha, which is the most common measure of scale reliability (Pallant, 2011). The findings of the quantitative analysis were then presented in tabular format, and included graphs and diagrams to enable the reader to interpret the results.

e. Ethical clearance

Prior to the collection of any data, the researcher gained ethical clearance from the University of South Africa (UNISA). An ethical clearance certificate for the research was granted by the Ethics Committee of the School of Economic Sciences (Appendix C). This was in compliance with the UNISA Policy on Research Ethics.

1.5. KEY CONCEPTS

This section includes the key definitions and meanings of terms that will be used throughout the study.

1.5.1. Marine tourism

Orams (1999:9) defines coastal and marine tourism as, "those recreational activities which involve travel away from one's place of residence which have as their host or focus, the marine environment and/or the coastal zone". The marine environment comprises waters that are saline and tide-affected and is made up of marine ecosystems, such as coral reefs. Coastal environments, on the other hand, are those areas which border the marine environment (Orams, 1999). Recreational activities in the marine environment include scuba diving, snorkelling, yachting, water-skiing, wake-boarding, boat-based fishing, wildlife watching, scenic boat cruising, sea-kayaking, surfing, surf-ski paddling, kite surfing, windsurfing, stand-up paddle boarding, and swimming (ASCLME, 2012; EAME, 2004; Orams, 1999). The marine tourism industry consists of a diverse range of businesses. They may include small operations such as scuba diving businesses, fishing charters, and moderate to large operations such as yachting, whale-watching, fishing and cruise ships (Orams and Lück, 2014). Coupled with this are the supply chain agencies (such as tour operators and travel agents) and businesses that provide support to these marine tourism industries (government agencies, law enforcement, marine safety organisations, rental agencies, equipment suppliers, travel and accommodation suppliers and repair and maintenance shops) (Orams, 1999; Orams and Lück, 2014).

1.5.2. Scuba diving tourism

Scuba diving tourism is a form of marine tourism (Orams, 1999). The World Tourism Organisation (WTO) defines dive tourism as “persons travelling to destinations with the main purpose of their trip to partake in scuba diving” (WTO, 2001:85). A tourist can be defined as a person who travels outside their usual environment (George, 2013), or who visits another destination for at least 24 hours, for leisure and study purposes, for health reasons or for business travel (UNWTO, 2004). Leisure, as defined by Gunter (1987), is characterised by a sense of separation from the everyday world, feelings of intense pleasure, freedom of choice and adventure; leisure represents an opportunity for recreation (George, 2013). Tourism, recreation and leisure are thus activities that are closely linked (George, 2013) and recreational scuba diving can therefore be described as a leisure activity. Scuba diving is classified as an adventure sport in which activities are concentrated mainly around the remote tropical and small island regions of the world, close to coral reefs typically surrounded by warm clear waters (Lindgren, Palmlund, Wate and Gössling, 2008; Spalding, 2001). In this study, the shortened term, ‘dive tourism’ is used.

1.5.3. The East African Marine Eco-region (EAME)

The Eastern African Marine Eco-region (EAME) extends for over 4 600 kilometres along the eastern coastline of Africa. It is an area that includes the territorial waters and Exclusive Economic Zones (EEZ) from southern Somalia extending south through Kenya, Tanzania, Mozambique and the north-east coast of South Africa (EAME, 2004; Oglethorpe, 2009; USAID, 2009). This coastal region functions largely as a unit, or ecological region, given that throughout the East African coast, the shores and coastal seas harbour a characteristic set of species, habitats, dynamics and environmental conditions (Oglethorpe, 2009). The total estimated area covered by the eco-region is 540 900 km², with the offshore limit extending to the 200-metre depth contour, beyond the continental slope (EAME, 2004; Obura, 2005a; Oglethorpe, 2009).

The EAME is also home to a host of marine species along with endangered species including the coelacanth and dugong, and several species of whales and marine turtles, 10 to 15% of which are endemic to the region (Oglethorpe, 2009). This marine ecosystem, comprising its various habitats, communities and species, constitutes the marine biodiversity of the East African region. Oglethorpe (2009) attributes the EAME’s unique species richness to its north–south orientation along the East African coastline, covering about 30 degrees of

latitude from the equator. This contributes to high levels of biodiversity, exceeding 11 000 species of plants and animals (1 500 species of fish, 200 species of coral, 34 species of marine mammals, nine species of mangrove, 12 species of sea grass, 1 000 species of marine algae, several hundred sponge species, 3 000 species of molluscs, 450 species of crabs and at least 300 species of echinoderms). Much of the coral reef ecosystems in the EAME are located within marine protected areas (MPAs) which are discussed in more detail in sections 1.5.5 and 3.4.4.3.

In the context of this study, when referring to the East African Marine Ecoregion, the acronym EAME will be used. However, reference will also be made to specific countries along the eastern coastline of Africa and these countries will be referred to by their respective individual names (Kenya, Tanzania, Mozambique, South Africa). The countries mentioned are all situated within the EAME and are referred to as EAME countries.

1.5.4. Coral reefs

Coral reefs are among the most biologically diverse ecosystems on earth. They provide a habitat for over a million species in the coastal and shallow-water areas. These areas contain some of the world's most productive ecosystems, providing a habitat for over a million species, including 4 000 fish species and 800 known species of coral living in and among the mangroves, coral reefs and sea grass beds (Buddemeier, Kleypas and Aronson, 2004; Grimsditch and Salm, 2006; Spalding, 2004; Talbot and Wilkinson, 2001; Vernon, 2000). Coral reefs can be characterised as massive coral colonies made up of thousands of tiny marine invertebrates called polyps that secrete skeletons of calcium carbonate (limestone). These form coral communities which collectively make up a coral reef ecosystem (Souter and Linden, 2005). Coral reefs are unique ecosystems in that they are three-dimensional shallow water structures made up mostly of scleractinian (hard) corals which can be described as reef-building corals (Payet and Agricole, 2006). These corals form the basis of all coral reef communities. Although coral reefs cover only 0.2 % of the world's oceans, they contain about 25% of marine species and are renowned for their biological diversity and high productivity (Floros et al., 2013; Jury, Mthembu, Masinga and Cuamba, 2004). Corals grow best in the shallow, clear waters of tropical and subtropical oceans where the annual temperature range is between 18–30 °C with an optimal range of between 26–28 °C. This can be seen in the latitudinal distribution of coral reefs, where the temperature is closer to the

optimal value, providing reefs with higher coral diversity closer to the equator (Van As, Du Preez, Brown and Smit, 2012).

1.5.5. Marine Protected Areas (MPA's)

MPAs can be defined as “coastal and sea areas enjoying some level of legal protection nationally or locally, and that are especially dedicated to the conservation, protection and maintenance of biodiversity and associated cultural resources” (Francis, Nilsson and Waruinge, 2002:503). MPAs are recognised as playing an effective role in the conservation of reef ecosystems (Halpern, 2003) and attract the managed recreational use of coral reefs and marine ecosystem resources through activities such as scuba diving (Thurstan, Hawkins, Neves and Roberts, 2012). The primary purpose of an MPA is to protect and maintain biological diversity and cultural resources. This is managed and enforced through legal and other effective means (Francis et al., 2002). MPAs are considered to be a crucial element of the conservation of the marine environment (Thurstan et al., 2012). They have grown in number to over two and a half thousand globally in efforts to conserve coral reef habitats (Burke et al., 2011). Many documented studies exist which express the benefits that MPAs have for the conservation of marine resources and their ecosystems (Johnson and Sandell, 2014; Leenhardt, Low, Pascal, Micheli and Claudet, 2015; Selig and Bruno, 2010). These conserved resources have resulted in the increased attractiveness of MPAs to scuba divers and snorkelers (Barker, 2003).

1.5.6. External risks

Risk can be described as the potential of loss or harm to a person, group, organisation, system or resource, known as an entity (Raval & Fichadia, 2007). External risks, according to Shaw (2010), can be divided into two groups, namely, domestic and international risks. Domestic risks occur within the host country, while international risks are risks that occur outside the host country's borders. These are characterised as external risks and have the potential to impact negatively on an entity either directly or indirectly (Shaw, 2010). While Saayman and Snyman (2005) concur that there are internal and external risks (domestic and international), they also identify internal and external risks within the domestic paradigm. For the purposes of this research, external risks are those risks which occur outside of the business and include both domestic and international risks.

1.6. STRUCTURE OF THE DISSERTATION

The chapters in this dissertation are structured as follows:

Chapter 1 provides the background to the study and also includes the problem statement, the research objectives, the introduction to the research design and methodology, as well as definitions of the relevant terms used throughout the dissertation. Chapters 2 and 3 present the literature review. Chapter 2 provides a review of the literature relating to scuba diving tourism and scuba diving tourism in East Africa, while Chapter 3 discusses the external risks relating to the scuba diving industry in the EAME, a framework for external risks, and the individual risks that have been identified in the domestic and international external risk context. Chapter 4 sets out the 11 steps followed in the research design and methodology. These include the phases of the research; study sites; research design; sampling plan; research ethics; the research instrument; pilot testing; data collection; data processing; and data analysis. The chapter concludes with an introduction to the presentation of research findings. Chapter 5 reports the overall results gleaned from the data obtained in the primary data collection process. Part A of Chapter 5 presents the biographical information obtained as well as the overall results and the ranking of external risks. Part B consists of a cross-case analysis of the countries covered in this study. This is followed by a discussion of the individual risks relative to each country. Chapter 6 summarises the overall findings in terms of the primary and secondary research objectives they address. The chapter concludes with a discussion of the limitations of the study and recommendations for further research. Figure 1.2 presents the structure of the dissertation by illustrating the chapter outline.

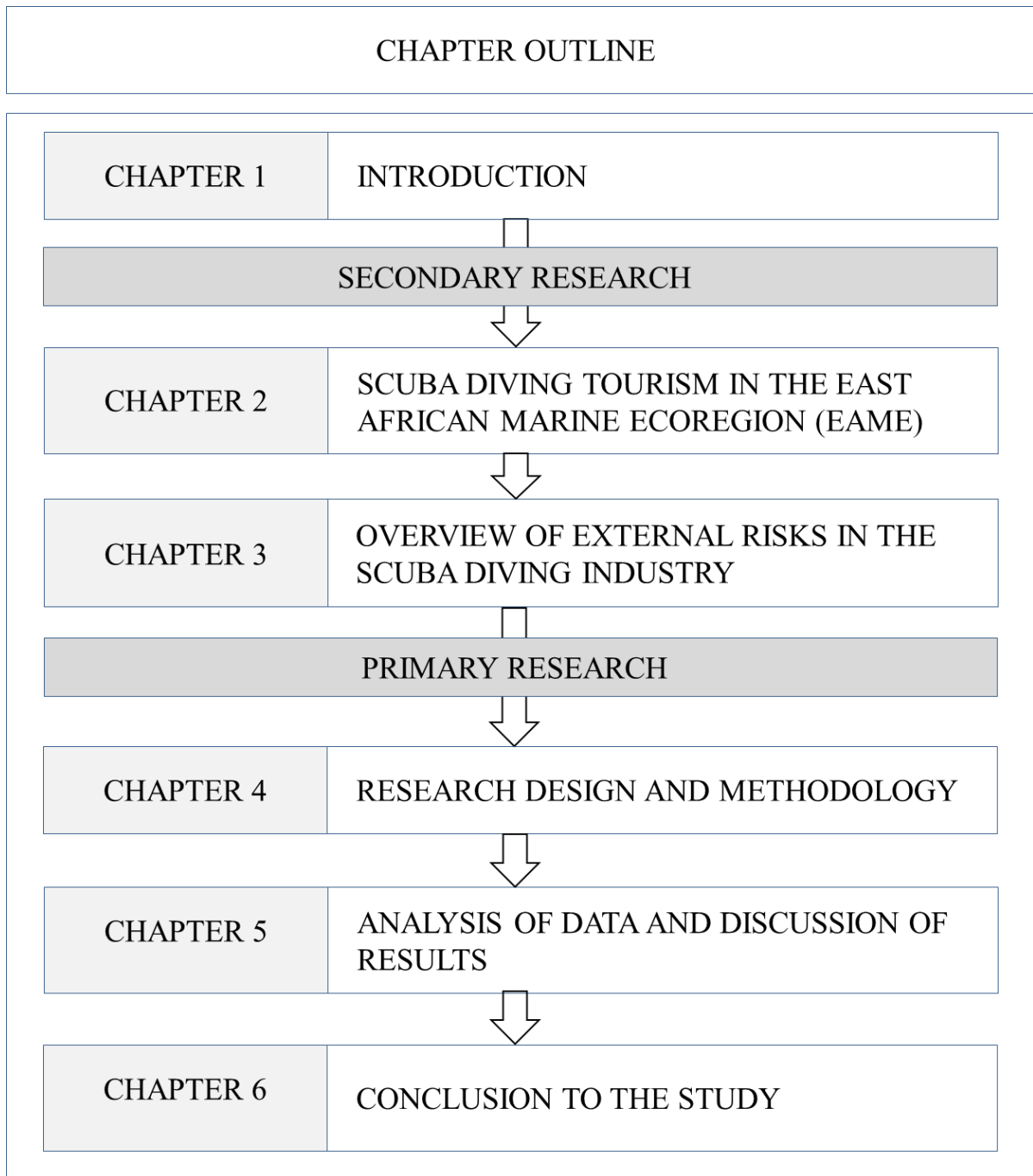


Figure 1.2: Chapter outline of the dissertation

CHAPTER 2

SCUBA DIVING TOURISM IN THE EAST AFRICAN MARINE ECOREGION (EAME)

2.1. INTRODUCTION

The literature in Chapters 2 and 3 reviews a range of topics relevant to this research. Figure 2.1 illustrates the structure and flow of the literature review undertaken in these chapters. Each aspect discussed in the sections that follow is indicated in the figure.

Figure 2.2 below presents the structure of Chapter 2 in detail. Section 2.2 of this chapter introduces scuba diving tourism and its relation to marine and coral reef tourism. This section also discusses coral reefs and dive tourism; destination image and attractions; diver demographics; the economic value of coral reefs; and the Scuba Diving Tourism System (SDTS). Section 2.3 highlights and discusses scuba diving tourism in the EAME in the context of tourism growth in the EAME; dive tourism hotspots in the EAME; coral reef distribution in the EAME; and coral reef morphology in the EAME. Section 2.4 concludes the chapter.

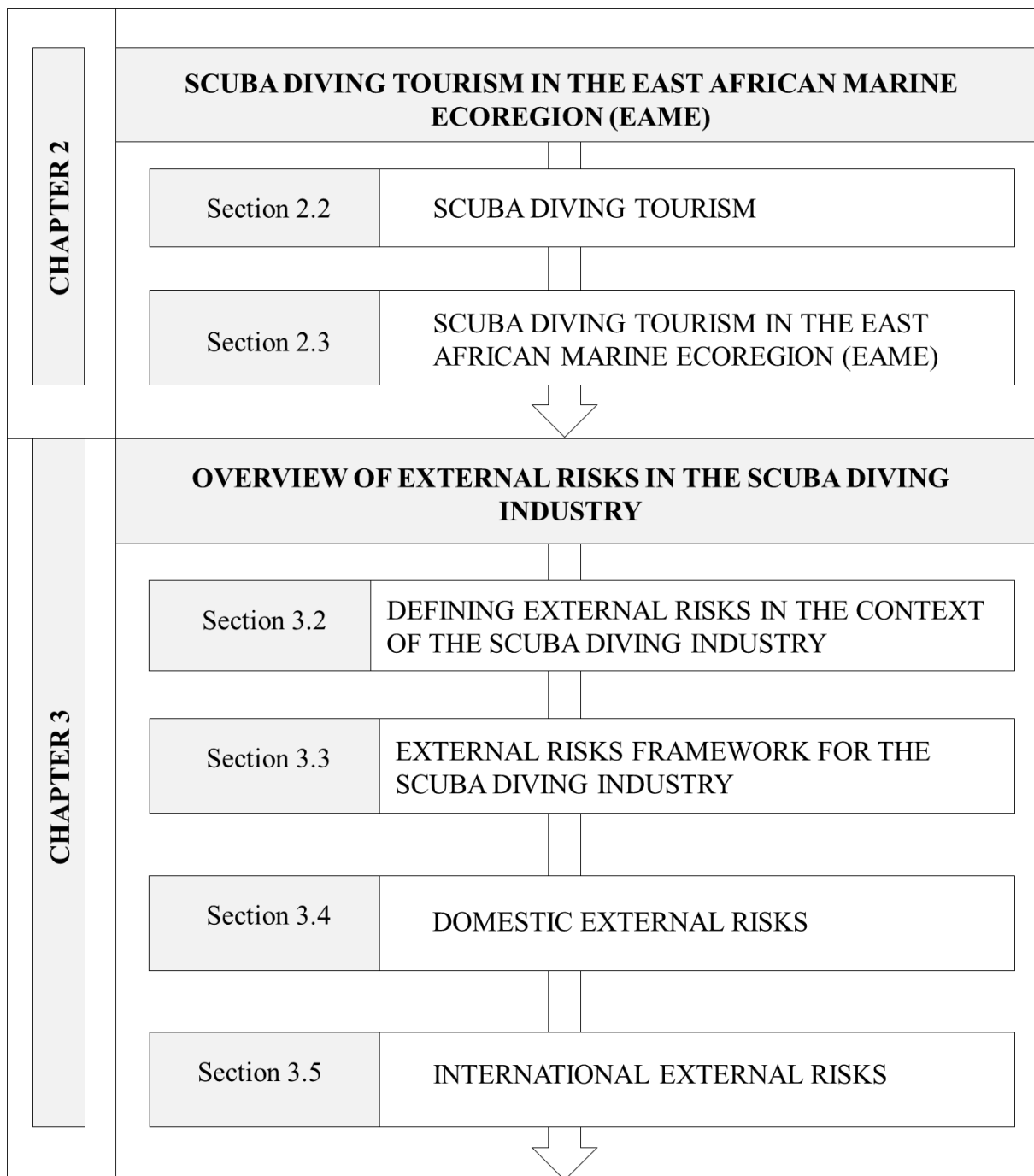


Figure 2.1: Structure and flow of the literature review

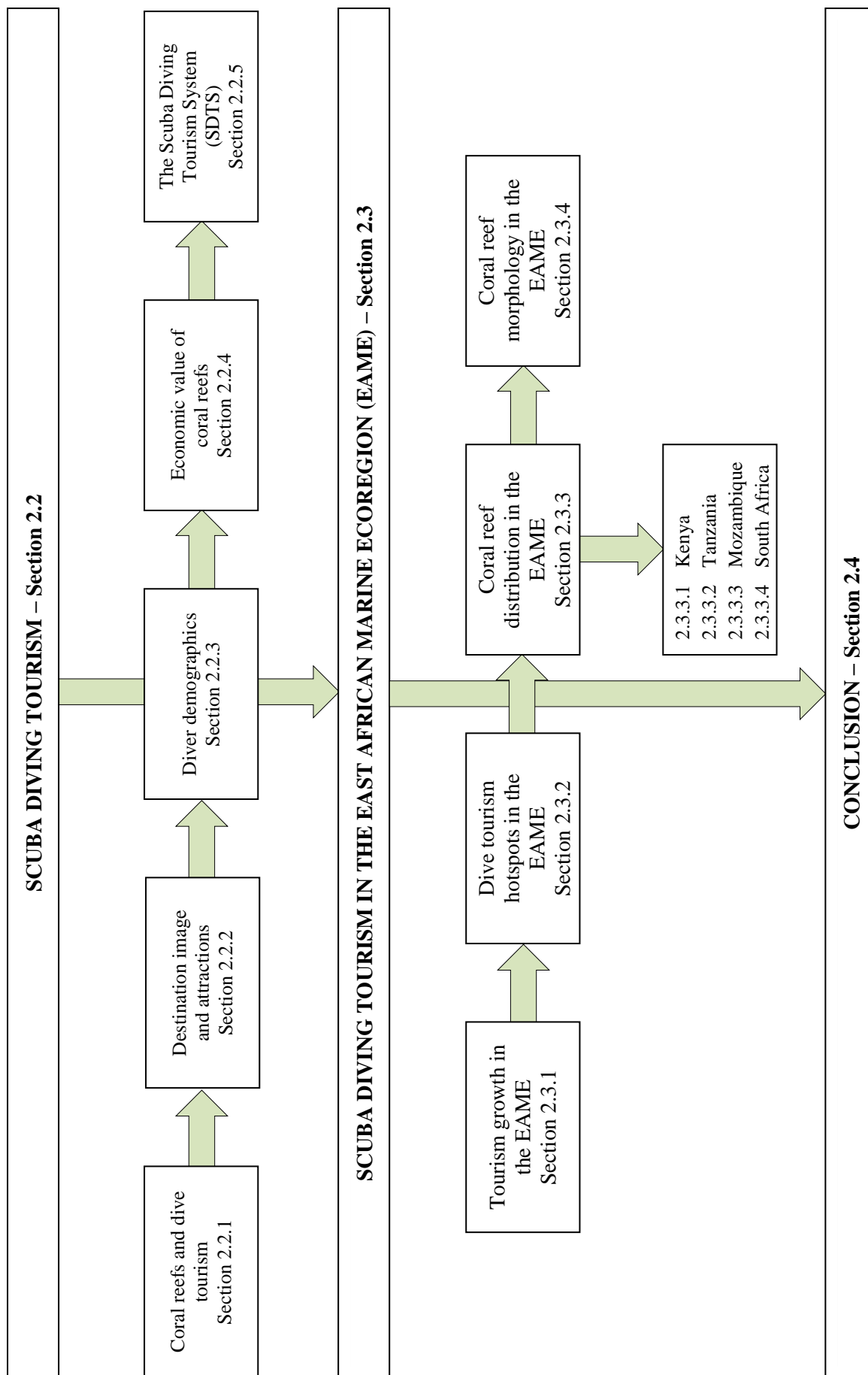


Figure 2.2: Structure and flow of Chapter 2

2.2. SCUBA DIVING TOURISM²

Marine and coral reef tourism are tourism sectors that attract tourists seeking to take part in recreational activities in and around oceanic and coastal waters and coral reef ecosystems (Burke et al., 2011; Orams, 1999; Spalding et al., 2017). The use of marine resources such as beaches and coral reefs is a key determinant for the fulfilment of tourism-related activities in the marine tourism industry, making it an integral part of the tourism economy (Orams, 1999). Tourism in marine environments, specifically in eastern and southern Africa, has become a major force in attracting large numbers of tourists (Obura, Celliers, Machano, Mangubhai, Mohammed, Motta, et al., 2002). The viewing of marine wildlife in their natural habitat is an activity that has grown significantly over the years and scuba diving is a prime example of an MRA (Nelson, 2007; Obura et al., 2002).

Garrod and Gössling (2008:7) quote the WTO, which defines scuba diving tourism as, “individuals travelling from their usual place of residence, spending at least one night away, and actively participating in one or more diving activities, such as scuba diving, snorkelling, snuba³ or the use of rebreathing apparatus”. The WTO (2001) states that one in three divers travel overseas for a diving holiday, while the remainder dive closer to home or within their own country of residence. Recreational scuba diving has become a popular leisure activity-based sport among tourists in recent years, given that dive sites have become more accessible, and this trend is expected to continue (Garrod and Gössling, 2008; Musa and Dimmock, 2013).

The growth in international tourism has played an important role in increasing the popularity of diving, enabling divers to travel to more remote destinations around the world. While most scuba divers reside in the northern hemisphere such as in Europe and the USA, the majority of the top dive locations are situated in the tropical regions of the world where pristine coral reefs can be found (Garrod and Gössling, 2008). An example of this is the Coral Triangle of Southeast Asia, which is arguably the world's leading recreational scuba diving destination, recognised for its outstanding dive quality and accessibility (Lew, 2013). International travel is thus a key element in scuba diving tourism (SDT).

2 The terms ‘scuba diving tourism’ and ‘dive tourism’ will be used interchangeably throughout the study.

3 Snuba is a combination of a snorkel and scuba gear where the diver breathes through a regulator while the air supply floats on a comforting support raft at the surface (Snuba, 2016).

The economic value of dive tourism is the result of an increasing tourism demand for scuba diving, which has resulted in the global emergence of this niche tourism sector (Davis and Tisdell, 1996; Dimmock, Cummins and Musa, 2013; Rudd and Tupper, 2002). This high-yield tourism sector is made attractive by countries that promote their destination image to attract scuba diving tourists to these marine hotspots. SDT is a constantly growing industry. With an estimated 28 million active divers in the world (Garrod and Gössling, 2008), scuba diving is a rapidly growing leisure activity with global growth of around 13% a year (PADI, 2015). With divers learning about new destinations and becoming more adventurous, one in four active scuba diving tourists are constantly looking for new dive destinations (Garrod and Gössling, 2008). This has created new markets for the dive tourism industry, ranging from leisure-based recreational diving activities to adventure dive destinations (Garrod and Gössling, 2008).

Recreational scuba diving has increased in popularity in recent decades to the extent that “scuba diving and the business activity supporting it have become important tourism sectors stimulating a billion dollar global industry” (Dimmock and Musa, 2015:1). Ruiz-Frau, Hinz, Edward-Jones and Kaiser’s (2013) study identified the financial value of various recreational users for marine-based recreational activities. They concluded that, on average, dive tourists spend more on their travel expenditure than other types of marine tourists, further supporting that scuba diving activities are among the highest revenue streams for coastal tourism businesses.

The following subsections relate to the SDT conversation and will be discussed next: coral reefs and dive tourism; destination image and attractions; diver demographics; economic value of coral reefs; and the Scuba Diving Tourism System (SDTS).

2.2.1. Coral reefs and dive tourism

Tourism and recreation on coral reefs is enjoyed by millions of people every year and many developing countries depend on this revenue to sustain their economies (Floros, 2012; Floros, Schleyer, Maggs and Celliers, 2012). Jackson (2002) identifies four major categories of socioeconomic links between coral reefs and tourism:

1. Coral reefs provide protection of the coastline from erosion and severe storms.
2. They provide a high biodiversity of marine resources for recreation.
3. They are responsible for the high productivity of marine life.

4. They are instrumental in the fields of medicinal research, science and education, thereby promoting a primary attraction for tourists.

The relationship between coral reefs and SDT can therefore be attributed to the recreational activities that occur on them (Becken and Hay, 2007). Ruitenbeek (1999) states that recreation is often cited as the most significant economic function of coral reefs. They are the main attraction for high value tourism interests, attracting divers and snorkelers, as well as recreational fishermen. Coral reefs also provide the white sandy beaches which attract tourists to these locations, and are key to the destination image of tropical beach holidays (Burke et al., 2011). More than 100 countries benefit from tourism associated with coral reefs, and tourism contributes more than 30% of export earnings in more than 20 of these 100 countries (World Bank, 2010a; UNWTO, 2010).

2.2.2. Destination image and attractions

The WTO (2001:86) states that divers look for five attributes that would constitute an ideal dive site: “clear water, good visibility, plenty to do and see underwater, good diving facilities and dive centre staff who speak the diver’s language.” The WTO report also states that “the attraction of the destination is almost exclusively related to its dive quality rather than any other factor” (WTO, 2001:85). The image of a destination plays a key role in a tourist’s motivation and refers to their perception, impressions, imagination, prejudice and emotional thoughts about a particular place (Alhemoud and Armstrong, 1996; Crompton, 1979; Zhu, Lim, Xie and Wu, 2016). Various studies have found that divers prefer dive sites that have a natural reef in good condition, a variety of fish and other marine life, adventure, excitement and good visibility (Ditton, Osburn, Baker and Thailing, 2002; Mundet and Ribera, 2001; Pendelton, 1994).

Page (2007) expresses destination image as a mental construct that simplifies the process of decision making. The perceived image of a destination expresses a visual representation of a tourist’s thoughts about a particular place (Alhemoud and Armstrong, 1996; Jenkins, 1999). Uyarra, Watkinson and Cote’s (2009) study found that a diver’s level of enjoyment was dependent on the site conditions and the diver’s recollection of the site. The environmental characteristics of a marine environment shapes the perception of what a scuba diver is likely to experience, and this is directly linked to their expectations (Paterson, Young, Loomis and Obenour, 2012). Moskwa (2012) conducted a survey of dive tourists in Australia and found varying levels of emotional (place) attachment to particular dive sites. Her studies concluded

that when a diver's place attachment increases, diver behaviour becomes more environmentally friendly, increasing the likelihood that the dive site will become a popular diving destination.

2.2.3. Diver demographics

Scuba divers are generally considered to be higher income earners. The WTO (2001) reports that 78% of international dive tourists are employed full-time and that the average scuba diver earns between US\$60 000–US\$80 000 per year in the United States. Gössling, Linden, Helmersson, Liljenberg and Quarm (2008) confirm these findings, stating that as a result of the high costs associated with travel to diving destinations, the specialised equipment requirements and extensive training, divers fall mainly into the high-income bracket. Dive tourists also have extensive experience in travelling to different diving destinations. A WTO (2001) study found that one in three divers regularly take an overseas diving holiday every year.

Scuba diving is a sport dominated by individuals who fall mainly into the 30 to 40-year age group. Mundet and Ribera's (2001) survey conducted on the Mendes islands off the coast of Spain suggest that 56% of divers are between 31 and 45 years of age. Coghlan and Prideaux (2007), however, state that divers fall mainly into the 15 to 34-year age group, with the highest number of divers in this survey being between 20 and 29 years of age. Given these varying findings, the studies suggest that more recently, divers are beginning their diving careers earlier in life and generally continuing into their 30s and 40s as their wealth increases throughout their careers. The economic value of coral reefs is discussed next.

2.2.4. Economic value of coral reefs

The total net asset value of coral reefs is estimated at US\$800 billion dollars (Sukhdev, Bishop, Brink, Gundimeda et al, 2009), with the largest proportion being generated by tourism and fisheries (Cesar et al., 2003). Reef tourism has been estimated to be worth US\$35.6 billion per year (Spalding et al., 2017). Of the 284 000 km² of the world's coral reefs, the East African coastline constitutes approximately 7 000 km² (Burke et al., 2011; Obura et al., 2002; Richmond, 2011; Spalding, 2001). Potential net benefit streams per year can be further classified into fisheries, coastal protection, tourism and recreation, and biodiversity value from which the region derives economic and social benefits (Beaumont,

Austen, Atkins, Burdon, Degraer et al, 2007; Cesar et al., 2003; Costanza, d'Arge, de Groot, Farber, Grasso et al., 1997).

The coastal boundary that surrounds the continents is the most productive part of the world's oceans (Naber, Lange and Hatzios, 2008). Such coastal and marine ecosystems contain certain ecosystem services. Naber et al. (2008) provide a comprehensive list of various types of coastal and marine ecosystem services that these marine systems enable, namely, provisioning services, regulating services, cultural services and supporting services. Figure 2.3 gives a breakdown of coastal and marine ecosystem services which are briefly discussed below.

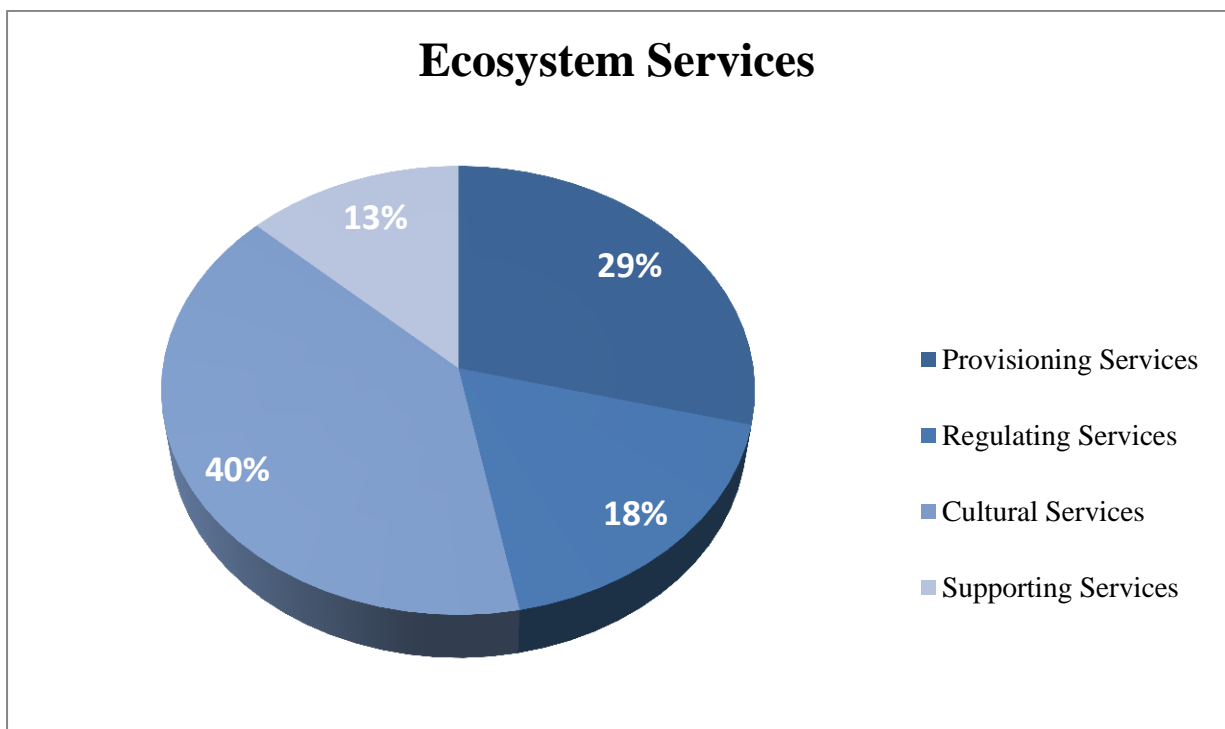


Figure 2.3: Marine ecosystem services

Source: Naber et al. (2008).

Naber et al (2008) found that, among the **provisioning services**, coral reefs contribute greatly by providing fish products (e.g. nutrition and livelihoods for coastal communities), pharmaceutical compounds and bio-prospecting (29%). **Regulating services** entail those services that are an established arrangement and organisation of formations which provide for the development and ecological balance of an ecosystem. These may be in the form of beach formation which is important for tourism; buffer zone protection from wave energy and storm surges which protect sensitive intertidal and mangrove areas; and absorption of carbon from

the atmosphere by corals (18%). **Supporting services** offer nutrient recycling, ecologically balanced marine ecosystems and resistance to diseases (13%).

Cultural services, according to Naber et al. (2008), are the most well-known coastal and marine ecosystem services and relate specifically to tourism-related activities (40%). These activities include the use of coral reefs for recreation, cultural belonging, aesthetics and education and research. Naber et al. (2008) found that almost 76% of **cultural services** refer exclusively to tourism and that the recreational value of these cultural services forms the vast share of the coastal and marine ecosystem services. Their study further revealed that coral reefs (34%) provide the highest value of all coastal and marine ecosystem services. This highlights the importance of coral reefs to the marine tourism industry and to SDT in particular. The Scuba Diving Tourism System (SDTS) is discussed next.

2.2.5. The Scuba Diving Tourism System (SDTS)

One of the key challenges facing the SDT industry has been the “integration of multiple stakeholders in a holistic and systematic way”, where a whole system approach is considered important to unravel the complexity of tourism activity and guide effective management and sustainability in the industry as a whole (Dimmock and Musa, 2015). Musa and Dimmock (2013) were the first to introduce the concept of a Scuba Diving Tourism System (SDTS), highlighting that stakeholders are dependent on each other within this system to ensure a holistic framework. The SDTS model highlights a multistakeholder approach to the scuba diving industry. According to Dimmock and Musa (2015), these stakeholders are comprised of the marine environment, the scuba divers (demand), and the scuba diving industry or supply side of dive tourism (scuba diving operators, charter operations, scuba diving education and training providers, and associated services and supporting tourism industries such as accommodation, transport, food services, retail and other services catering for scuba divers). Musa and Dimmock (2013) developed this framework further to include the host community, demonstrating that each stakeholder is a key element of the SDT system. Figure 2.4 describes the SDTS, after which each element is briefly outlined.

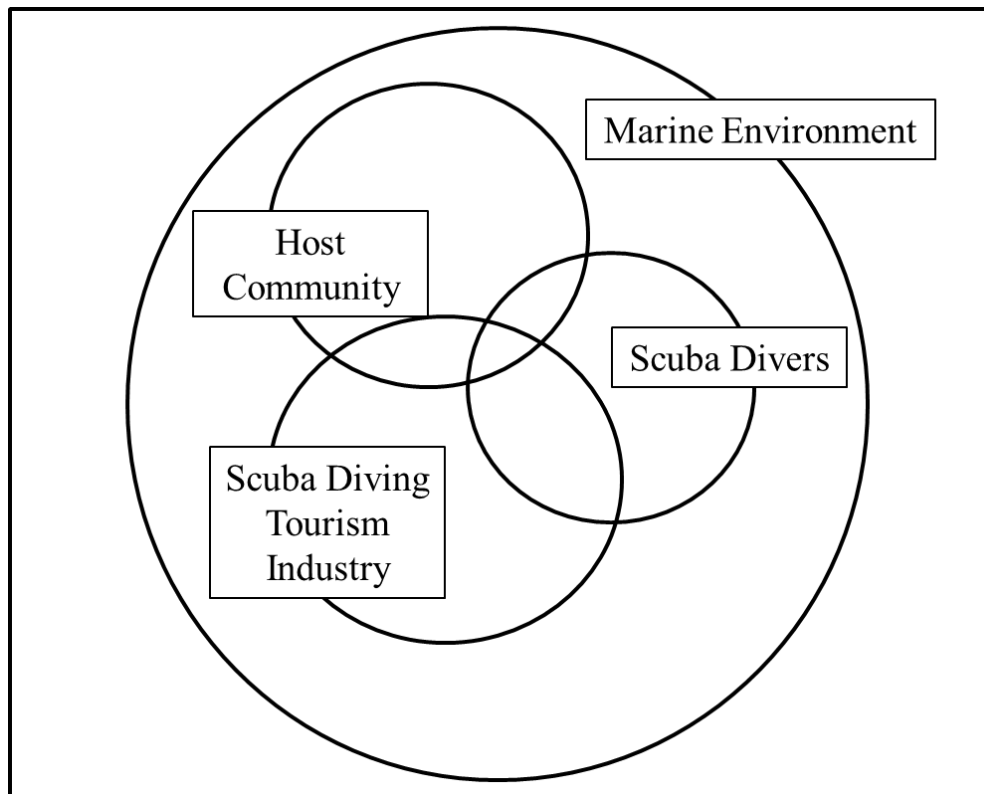


Figure 2.4: The Scuba Diving Tourism System (SDTS)

Source: Dimmock and Musa (2015).

The marine environment contains the factors that attract individuals to scuba diving for recreation, adventure seeking and leisure. Dimmock and Musa (2015) emphasise the marine environment as being the core of the SDTS, for without it, the other key stakeholders would not exist. All stakeholders, including the host community, are dependent on this marine environment (Dimmock and Musa, 2015). The SDTS therefore depends on the accessibility, careful management and responsible use of the marine environment to allow for the sustainable growth of the scuba diving industry.

Scuba divers represent the second stakeholder group, who travel to experience the marine environment and its natural diversity. Divers also seek opportunities to view and experience diverse underwater sites and landscapes, and the rich and distinctive biodiversity of fauna and flora (Lew, 2013; Ong and Musa, 2011), creating the demand for SDT through their motivations and expectations of marine environments. Scuba diving markets are heterogeneous (Garrod, 2008), varying according to diving experience and demography, aspirations and needs. What determines the scuba divers' attraction to a region is their motivation for wanting to travel to the destination and also the experience they wish to derive

from dive tourism (Edney, 2012; Ong and Musa, 2011; Wong, Thirumoorthi and Musa, 2013). The motivation to dive in a particular site is influenced by several factors such as location, diver demography, gender and level of diving specialisation (Wong, et al., 2013).

The scuba diving industry is the third stakeholder in the SDTS framework. The SDT industry is comprised of various support services which scuba divers are highly dependent upon. These are the suppliers of scuba diving services, namely, scuba diving operators, charter operators, scuba diving training and education facilities, and dive retail shops (Dimmock and Musa, 2015). Associated system services include information providers, marketers, travel agents, accommodation, transport, food and beverage services, souvenir outlets, retail services, medical services, and other services catering for both scuba divers and tourists (Dimmock and Musa, 2015). Developing these relationships between service providers builds collective and sustainable outcomes within the scuba diving industry. Within the scuba diving industry, there exists a cooperative inter-organisational environment both in the destination areas and extending to transit routes and tourism operators (Musa and Dimmock, 2013).

The host community is the final stakeholder group. The host community provides the social and cultural resources that enrich the travel experience by providing services to scuba divers and the SDT industry. The host community also includes local government which manages and provides access to valued marine environments such as marine reserves and MPAs. Host communities play a critical role in SDT. The continuous demand and constant supply of SDT services creates relationships and interactions between environmental and social systems involving host communities (Schianetz and Kavanagh, 2008).

The four stakeholders within the SDTS are dependent on each other for the success of the dive tourism industry. Each stakeholder has its own roles and responsibilities, and prioritises resources and functions according to its needs and the demands placed on it by the dive tourism industry and its dive tourists (Johnson, 1999). The areas of overlap in Figure 2.4 indicate the interaction between each of these stakeholders. It is these interactions that determine the success or failure of the SDTS. As a scuba diving operator cannot function in isolation, neither can the host community, as the scuba diving industry is dependent on these various interactions for its success (Dimmock and Musa, 2015). It is these “unique perspectives at the local level that provide a process for exchange and greater collective understanding” (Dimmock and Musa, 2015:53). Thus, scuba divers, the marine environment,

the host communities and the scuba diving industry (and all associated industries) are fundamental to the success of the SDTS. SDT in the East African Marine Ecoregion (EAME) is discussed next.

2.3. SCUBA DIVING TOURISM IN THE EAST AFRICAN MARINE ECOREGION (EAME)

Countries tend to promote their marine resources in efforts to become scuba diving destinations and SDT hotspots (Dimmock and Musa, 2015). In East Africa, scuba diving is made popular by the high abundance of marine biodiversity and clear calm waters that make up the coral reef ecosystems (Obura et al., 2002). The subsections that are covered next include tourism growth in the EAME, dive tourism hotspots in the EAME, coral reef distribution in the EAME, and coral reef morphology in the EAME.

2.3.1. Tourism growth in the EAME

Tourism is recognised as an important contributor of growth towards gross domestic product (GDP) (UNWTO, 2004; UNWTO, 2007; UNWTO, 2009; WESP, 2015). In 2014, global tourism accounted for 9% of global GDP (UNWTO, 2015a). The long-term global outlook forecasts international tourist arrivals to increase by 3.3% a year between 2010 and 2030 to reach 1.8 billion tourists by 2030 (almost twice the number of tourists presently) (UNWTO, 2015a). With ever-increasing tourist destinations becoming more accessible worldwide, there has been a substantial investment in tourism development, turning the sector into a key driver of socioeconomic progress through the creation of jobs and enterprises, export revenues and infrastructure development (UNWTO, 2015b).

The value that tourism brings to countries' economies can be a significant measure of their GDP. Visitor exports to Africa are rising and generated US\$51 billion of total revenue in 2014 (WTTC, 2015a). This is expected to increase to US\$84 billion by 2025 (WTTC, 2015b). In 2014, slightly over half of all overnight visitors travelled to their destination by air (54%), while the remainder travelled by surface transport (46%) (UNWTO, 2015a). The trend over time has been for air transport to grow at a somewhat faster pace than surface transport, making travel to African countries more accessible, as over the next 20 years, air passenger traffic is expected to double from current levels (Airbus, 2015; Boeing, 2015; Flightstats, 2016).

Tourists arriving in Sub-Saharan Africa have grown over 300% since 1990, with 2012 marking a high of 34.7 million tourists who visited the region (World Bank, 2013a; UNWTO, 2015b). Source markets for international tourism have traditionally been largely concentrated in the advanced economies, however with rising levels of disposable income many emerging economies such as those in the EAME countries, have demonstrated fast growth over recent years (Christie, Fernandes, Messerli and Twining-Ward, 2013; UNWTO, 2015a).

For countries in the EAME, tourism in 2015 brought substantial revenue to the local economy and to the region as a whole. Forecasts provided by the WTTC (2015a) indicate a progressive rise in direct contributions to the GDP of Kenya, Tanzania, Mozambique and South Africa, as well as an anticipated increase in visitor numbers. This growing trend is expected to provide higher revenue for visitor markets and long-term growth (WTTC, 2015b). Countries in the EAME have shown an increased trend in international tourist arrivals over the past decade, with tourism growth projections for eastern and southern Africa expected to increase in market share by 2030 (UNWTO, 2015a). Table 2.1 shows the most recent international tourist arrivals and tourism receipts for the EAME countries and their percentage share within Africa.

Table 2.1: International tourist arrivals to countries in the EAME in 2013

EAME country	International tourist arrivals (000's)	Share (%) in Africa	International tourism receipts (US\$ million)	Share (%) in Africa
Kenya	1 433 ^a	2.63 ^a	798 ^b	2.2 ^a
Tanzania	1 063 ^a	1.95 ^a	1,950 ^b	5.4 ^b
Mozambique	1 886 ^a	3.47 ^a	241 ^a	0.68 ^a
South Africa	9 549 ^b	17.1 ^b	9 348 ^b	25.7 ^b

Source: UNWTO, 2015a; a: based on 2013 data; b: based on 2014 data (UNWTO, 2015b).

2.3.2. Dive tourism hotspots in the EAME

A number of definitions exist for 'dive tourism', 'tourism hotspot' and for 'hotspot', however, no formal definition for dive tourism hotspot can be found, even though the term is referred to in existing literature. For example, Hein, Lamb, Scott and Willis (2015) refer to "dive tourism hotspot" when describing the health of corals at sites in newly rezoned MPAs in Koh Tao, Thailand.

Merriam-Webster (2016) defines a hotspot as a place of more than usual interest, activity or popularity, while *Collins Dictionary* (2016) defines a hotspot as "any place regarded as a

centre for a specified activity or interest”, such as a vacation hotspot. Other authors refer to ‘tourism hotspots’ in other types of tourism. Wolf and Croft (2015), for example, describe the impacts of tourism hotspots on vegetation communities along hiking trails in South Australia; and Liggett, McIntosh, Thompson, Gilbert and Storey (2011) indicate the emergence of Antarctica as a potential future tourism hotspot.

Garrod and Gössling (2008:7) provide the following definition for scuba diving tourism (SDT): “Diving tourism involves individuals travelling from their usual place of residence, spending at least one night away, and actively participating in one or more diving activities, such as scuba diving, snorkelling, snuba or the use of rebreathing apparatus.”

Given the above definitions, combining ‘dive tourism’ with the term ‘hotspot’ would imply a place made popular by the main activity in the area, that is, scuba diving. In view of this discussion, the following definition of a dive tourism hotspot is proposed:

A dive tourism hotspot is an area (i.e. coral reef) where scuba divers frequently travel to, where scuba diving activities occur in a body of water (i.e. ocean) made popular by interesting characteristics (i.e. underwater features such as corals and fish species).

Dive tourism hotspots are thus expressed as areas in the EAME where coral reefs are present which attract dive tourists to the region. Most dive tourism hotspots are located within MPAs and are discussed in greater detail in section 3.4.4.3. The following areas along the east coast of Africa (within the EAME) are characterised as dive tourism hotspots for the purposes of this study and are also shown in Figure 2.5:

1. Kenya – Diani, Malindi, Mombasa, Kisite, Wasini, Watamu
2. Northern Tanzania – Dar es Salaam, Pemba Island, Tanga, Zanzibar (Unguja) Island
3. Southern Tanzania – Mafia Island, Mtwara
4. Northern Mozambique – Primeiras and Segundas Archipelagos, Quirimbas Archipelago
5. Central Mozambique – Bazaruto Archipelago, Inhambane, Vilanculos
6. Southern Mozambique – Inhaca and Portuguese Islands, Ponta do Ouro
7. South Africa – Rocktail Bay, Sodwana Bay

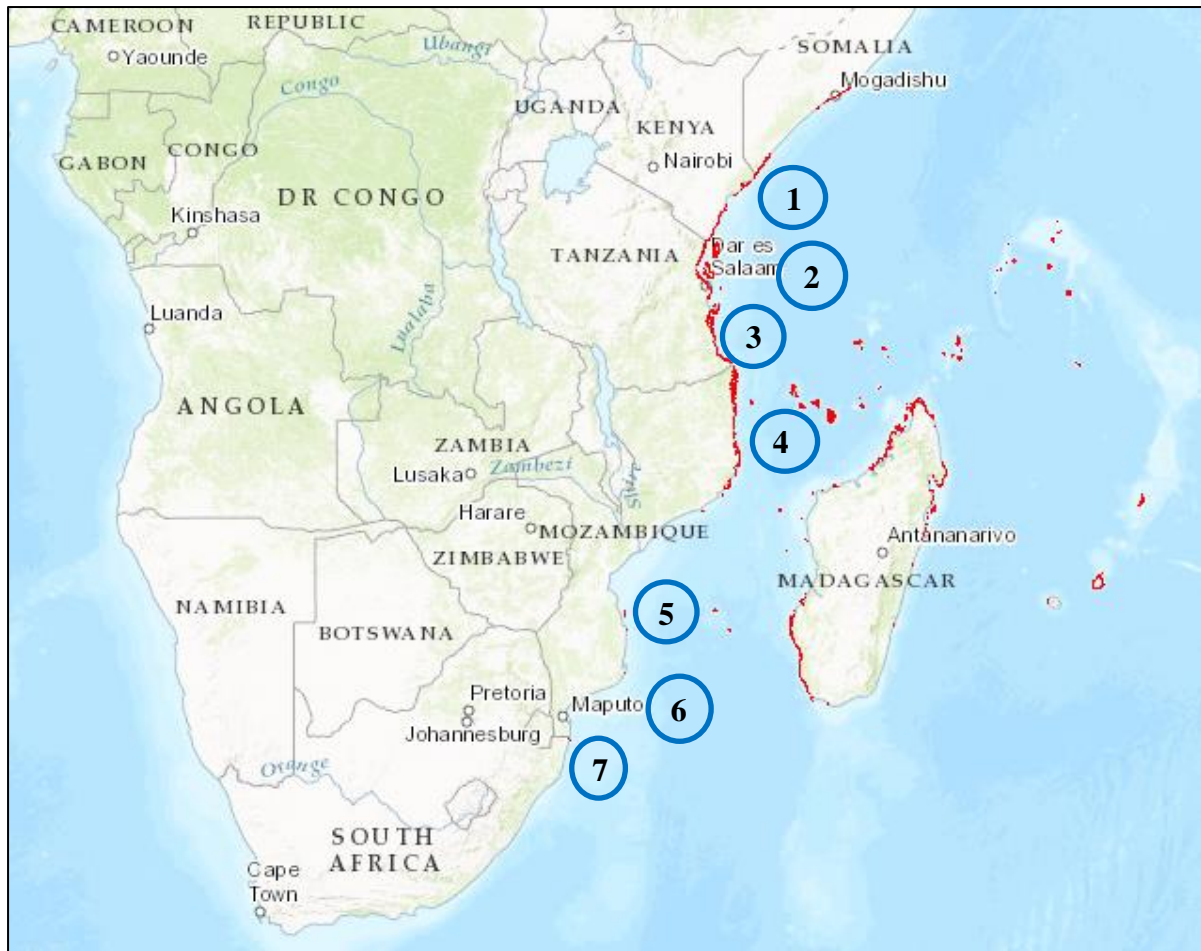


Figure 2.5: Dive tourism hotspots in the EAME

Sources (based on descriptions of scuba diving activities along the East African coastline): ArcGIS (2010); Coastal Livelihoods Assessment (CLA) Report (2010); Emerton and Tessema (2001); Heileman, Lutjeharms and Scott (2009); Honey and Krantz (2007); Lucrezi, Saayman and Van der Merwe (2013); Mograbi and Rogerson (2007); Nelson (2007); Obura et al. (2002); Suich (2006); Tibiriçá, Birtles, Valentine and Miller (2011).

2.3.3. Coral reef distribution in the EAME

Reefs generally develop in the near shore waters of large continental land masses, and are particularly well developed around islands and along coastlines within the tropics, typically occurring between 30° north and 30° south latitudes (Birkeland, 1997; Moore and Best, 2001; Spalding, 2001; Wallace and Rosen, 2006). Coral reefs are concentrated in warm, shallow areas around the globe such as Australia's Great Barrier Reef, the Caribbean islands, Indonesia and the Coral Triangle, the South Pacific and various parts of the East African continent and WIO islands (Spalding, 2001). Of the 285 000 km² of coral reefs in the world's oceans, the Indian Ocean represents just 11%, and the coral reef area of the EAME (Kenya, Mozambique, South Africa and Tanzania) constitutes over 6 000 km² (Spalding, 2001). Table 2.2 shows the area of coral reefs and coastal length of EAME countries in East Africa.

Table 2.2: Area of coral reefs and coastal length in East Africa

Country	Coral reef area (km ²)	Coastline length (km)
Kenya	620	536
Mozambique	1,860	2,470
Somalia	710	3,025
South Africa	40	2,881
Tanzania	3,580	1,424

Source: Spalding (2001).

Studies suggest that soft and hard corals are abundant in the EAME, specifically in Kenya, Tanzania, Mozambique and the KwaZulu-Natal coast in South Africa (Benayahu, Shlagman and Schleyer, 2003; Daly, Brugler, Cartwright, Collins, Dawson, Fautin, et al., 2007; SAAMBR; 2012). These hard and soft corals will be discussed in reference to coral reefs in the region.

The coral reefs along the east coast of Africa stretch between Somalia (10° N) and South Africa (28° S). The coast of the EAME may be characterised as mostly without a continental shelf where reefs are rarely more than 2 km from the coast (Muthiga et al., 2008). Where a shelf is present, the coast is typified by patch reefs. In areas where there is no shelf, fringing reefs dominate with lagoon platforms. Reefs tend to be absent around outflows of major river outlets (Arthurton, 2003). Coral reefs are extensive along the coasts of Kenya (620 km²), Tanzania (3580 km²), Mozambique (1860 km²), with only a few reefs in South Africa (40 km²) (Muthiga et al., 2008).

The following section describes the country-specific geographical characteristics and distribution of coral reefs that are predominantly used for scuba diving activities in the EAME and are referenced in order of the dive tourism hotspots identified in Section 2.3.2 and presented in Figure 2.5 above. The maps indicating the coral reefs in the region are provided in Figures 2.6 to 2.12.

2.3.3.1. Kenya

Much of **Kenya's** coast is relatively well developed for tourism, and beach areas around Mombasa and Kilifi are the most heavily developed coastal areas, offering an array of dive tourism activities (Nelson, 2007). Further north, dive tourism has dwindled with a number of dive operators closing their businesses due to low tourism demand brought on by security

concerns. Diving activities on the southern coast of Kenya at Kisite, Diani and Wasini are, however, more prominent (Emerton and Tessema, 2001).

The fringing reefs of Kenya are situated along the coast where they are exposed to the open ocean extending 200 km from Watamu near Malindi down to Shimoni further south (Abuodha, 1992; Arthurton, 2003). These fringing reefs dominate the Kenyan coastline, and are discussed below. Figure 2.6 illustrates the coral reefs present along the Kenyan coastline.

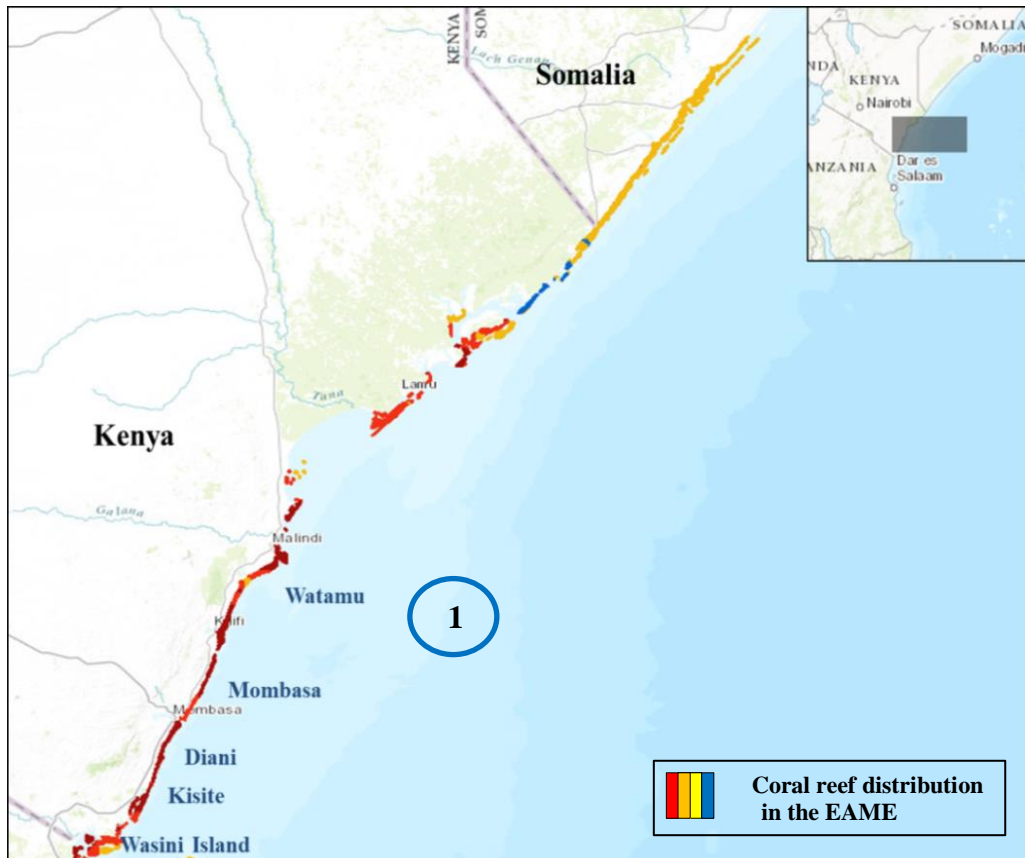


Figure 2.6: Coral reefs along the Kenyan coastline

Source: Burke et al. (2011).

Watamu is situated near the northern edge of a 200 km long fringing reef which stretches along the south Kenyan coast from Shimoni to the Malindi vicinity (Arthurton, 2003). Watamu Marine National Park (WMNP) (10 km²) and Watamu-Malindi Marine National Reserve (245 km²) contain extensive areas of coral species which house a unique biodiversity of marine life (Cowburn, Sluka and Smith, 2013; Watamu.net, 2008).

Mombasa's fringing reefs form reef bars which are typically a few hundred metres wide. Coral reefs are well developed on the ocean side and offer the best scuba diving. Mombasa,

with its high limestone cliffs, is a popular tourist area with beaches and access to snorkelling and diving (Arthurton, 2003; Sheppard, 2000).

Diani's fringing reef contains areas of rocky outcrops and beach sediments which rest on the reef platform (Arthurton, 2003). Apart from scuba diving, Diani provides a host of other marine recreational activities (McClanahan, 2002).

Kisite lies south of Diani and is a mere 39 km² and offers isolated patch reefs and rock island reefs. As a result of the protection of this area it has a high biodiversity of reef fish which congregate on fore reef slopes (KWS, 2016).

Wasini Island lies in southeast Kenya, near the village of Shimoni. Here, the fringing reef gives way to intertidal and shallow subtidal patch reefs where limestone cliffs and platforms are present, providing easily accessible coral reefs (Shaghude, Wannäs and Mahongo, 2002).

2.3.3.2. Tanzania

In **Tanzania**, the main dive tourism destination is the island of Zanzibar (Unguja), while the islands of Mafia and Pemba are the other dive tourism hotspots off the mainland coast (Honey and Krantz, 2007). A few coastal locales (such as Tanga) have intermediate levels of diving activities, whereas Dar es Salaam is more established and has much potential to expand (Honey and Krantz, 2007). Tanzania's southern coast is mostly undeveloped but areas such as Mtwara and Mnazi Bay are likely to grow substantially in coastal tourism in future (Honey and Krantz, 2007).

In Tanzania, the coral reef structures vary in composition and are described as the northern and southern Tanzanian coral reefs respectively (Kweka, Morrisey and Blake, 2003; Marine Parks and Reserves, Tanzania, 2016; Richmond, 2011). Rocky shores, sand beaches, mud flats, lagoons and algal beds form part of the overall diversity of marine life in northern Tanzania. Other coastal habitats such as mangrove forests, sea grass beds and coral reefs are found mainly in southern Tanzania. Details of the northern and southern reefs are provided below.

Northern Tanzania

The northern region of the Tanzanian coast includes the mainland areas of Tanga, Bagamoyo and Dar es Salaam, as well as the oceanic islands of Pemba and the continental island of

Zanzibar (Unguja). Figure 2.7 illustrates the coral reefs along the northern Tanzanian coastline.

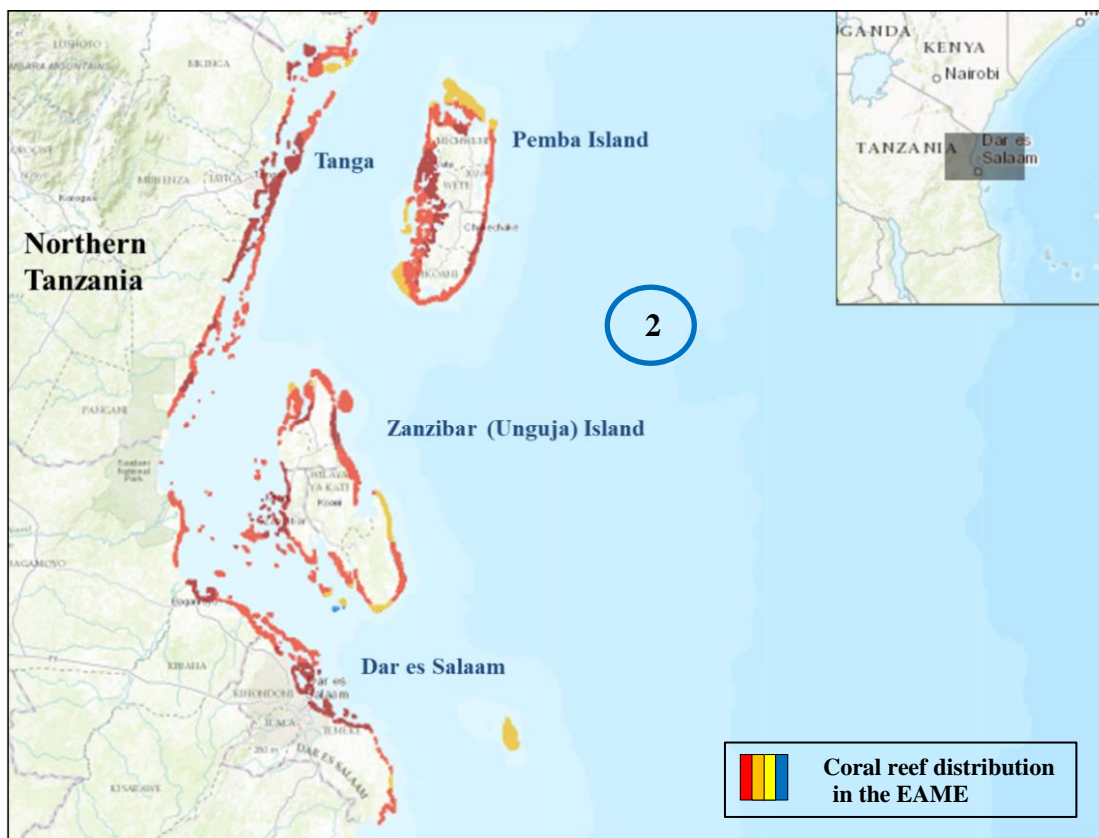


Figure 2.7: Coral reefs along the northern Tanzanian coastline

Source: Burke et al. (2011).

Tanga is the northernmost region of Tanzania, extending 180 km south from the Kenyan border. Reef development along the coast is composed of 41 distinct sections of coastal fringing reef covering almost 97 km (47%) of the coastline. There are also patch reefs along the length of the coast (McClanahan, McLaughlin, Davy, Wilson, Peters, Price, et al., 2004).

Pemba Island is situated 50 km north of Zanzibar Island and, given its remote location, is one of the top dive sites worldwide. Pemba Island is 62 km long and 22 km wide. An estimated 1100 km of reef on Pemba represents 45% of Tanzania’s coral reefs. Pemba Island is dominated by fringing reefs with branching, massive encrusted colonies providing a great abundance of fish diversity (Arthurton, Brampton, Kaaya and Mohamed, 1999; Horrill, Kamukuru, Mgya and Risk, 2000).

Dar es Salaam has a well-developed fringing reef made up of a series of reefs constituting the Dar es Salaam Marine Reserve system. North of Dar es Salaam are the islands of

Bongoyo, Fungu Yasin Sand Bank, Mbudya and Pangavini. South of Dar es Salaam are a number of patch reefs and broken fringing reefs (McClanahan et al., 2004).

Zanzibar (Unguja) Island is the most popular scuba diving island in Tanzania. The most popular areas for diving are in the south-east and northern parts of the island. Fringing reefs are found on the eastern coast and northern and southern extremities. There are also a well-developed reef formation and patch reefs around Mnemba Island in the north-east, one of Zanzibar's most popular dive sites. The highest levels of live hard coral have been found on the islands and patch reefs near Stone Town on the western side of Zanzibar Island, given that the south-western part of the island is not as prone to wave action as the eastern side. Fish densities are, however, higher on the eastern than the western side of the island (Horrill et al., 2000).

Southern Tanzania

The southern coast of Tanzania stretches for 690 km from Dar es Salaam to the Ruvuma River at the Mozambique border. The general distribution of scleractinian (hard) coral genera in southern Tanzania is high when compared to the 55 genera recorded for the entire East African region, thus supporting one of the finest shallow water coral reef and estuarine mangrove complexes in East Africa (Darwall and Guard, 2000). Figure 2.8 illustrates the coral reefs of the southern Tanzanian coastline.

Mafia island is well known for its whale shark sightings and abundance of coral reef diversity and vertical drop-offs, making it a very popular dive destination. To the south and east of the island are shallow waters which support abundant coral growth and a very high diversity of reef fish not found anywhere else in East Africa (Darwall and Guard, 2000).

Mtwara and the surrounding districts boast an exposed coastal fringing reef of 320 km. Coral reefs are found close to Mtwara Bay but also extend outward as spurs reaching heights of seven metres with a diverse cover of corals. The most developed bays in Mtwara also support a number of shallow patchy reefs (Darwall and Guard, 2000).

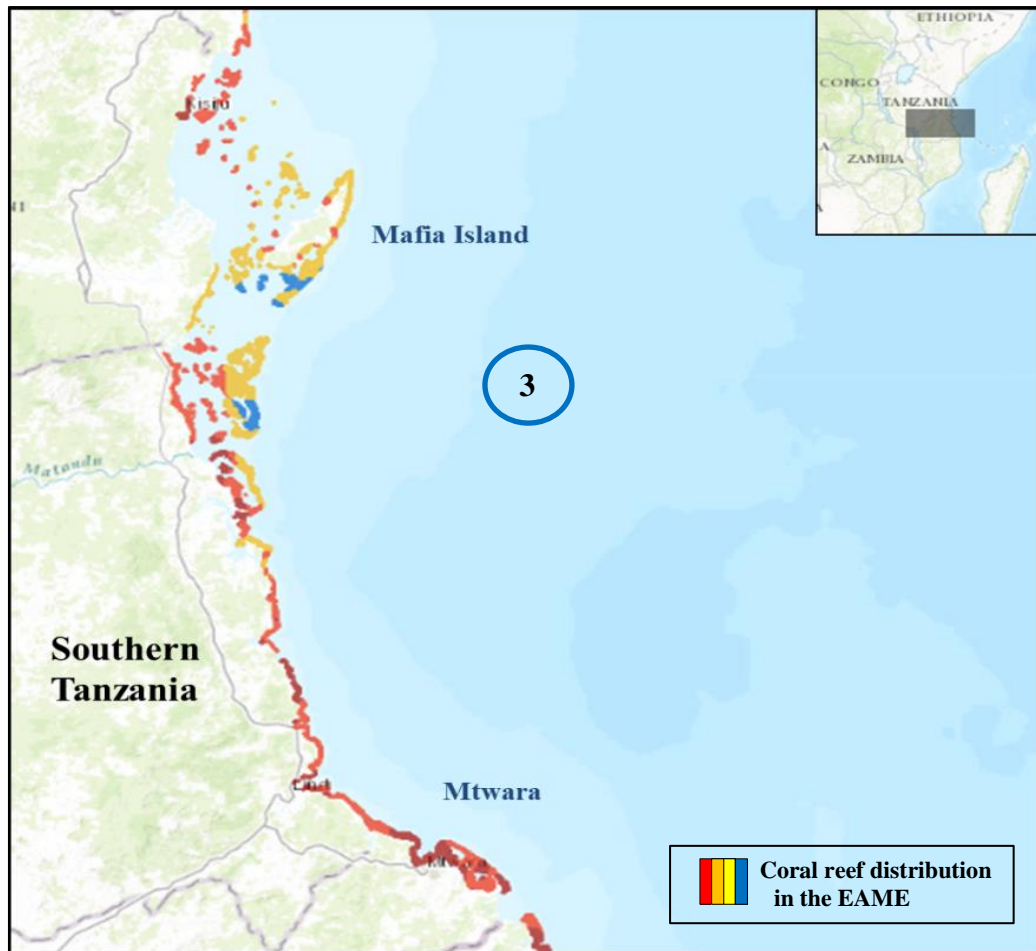


Figure 2.8: Coral reefs along southern Tanzania

Source: Burke et al. (2011).

2.3.3.3. Mozambique

Most of the marine-based tourism in **Mozambique** is relatively undeveloped with the exception of a few areas such as Vilanculos (Bazaruto Archipelago), Ponta do Ouro and Inhambane. Mozambique’s coastal tourism industry is showing signs of growth and newly established MPAs are drawing dive tourists to remote destinations such as the Premeiras and Segundas Archipelago and Quirimbas Archipelago in northern Mozambique (Honey and Krantz, 2007; Tibiriçá et al., 2011). The primary focus and main marine tourism activities along this stretch of the coast include recreational diving, sports fishing, spear fishing, luxury island lodges and resorts, snorkelling, and swimming with dolphins and whale sharks (Suich, 2006; Coastal Livelihoods Assessment (CLA) Report, 2010).

Northern Mozambique

Owing to its varying composition of geomorphology along the length of the coast, Mozambique's coral distribution is divided into three regions – northern, central and southern Mozambique – which are discussed in turn below.

The northern coast extends for 770 km and is characterised as a coral coast with numerous small islands that form the Primeiras and Segundas Archipelago and the Quirimbas Archipelago. Figure 2.9 illustrates the coral reefs of the northern Mozambique coastline.

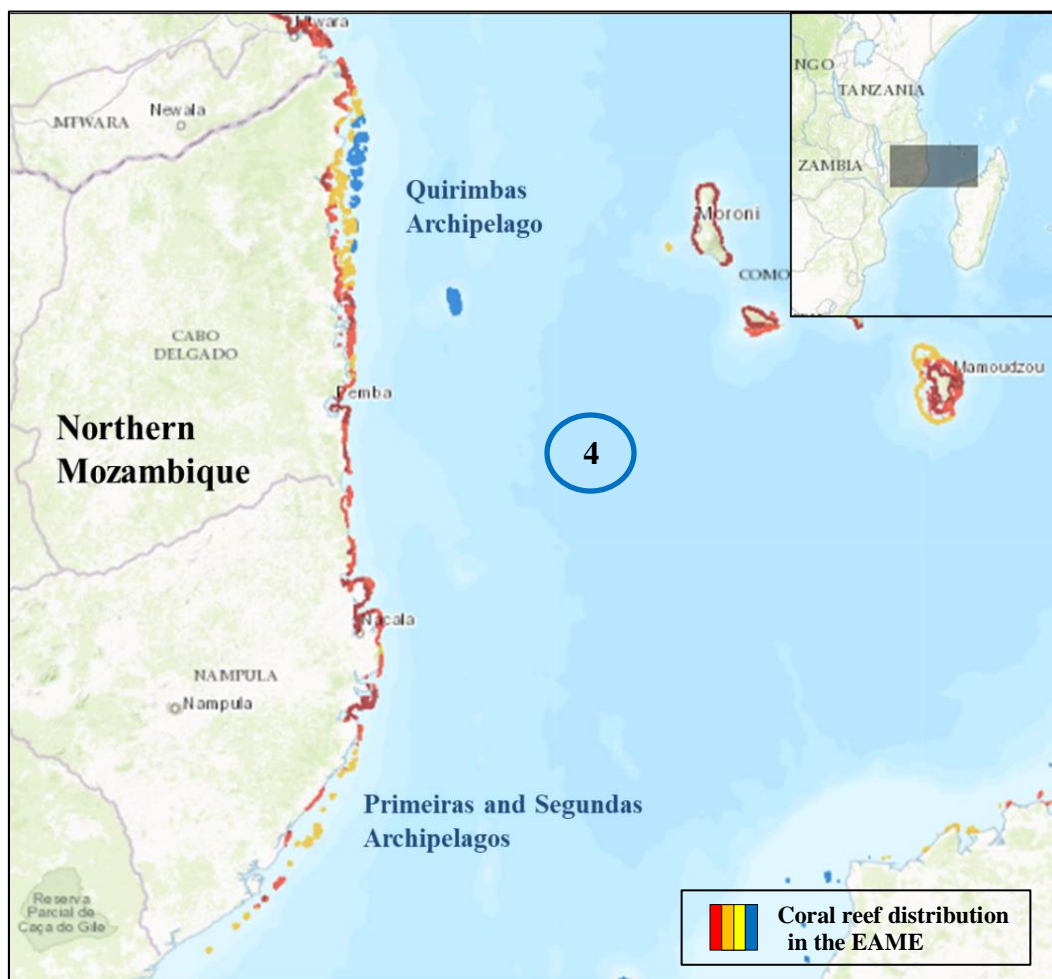


Figure 2.9: Coral reefs along northern Mozambique

Source: Burke et al. (2011).

The Quirimbas Archipelago has become known as the ‘African Caribbean’ because of its breath-taking diving, snorkelling, fishing and pristine surroundings. The natural beauty of the area includes mangroves, coral reefs, tall coconut palms and endless white beaches. The impressive 1500 km² marine area of Quirimbas National Park includes 11 coral islands that feature phenomenal vertical drop-offs, some up to 400 m. These walls are abundant with

coral covered caves, tropical fish and game fish, including kingfish, barracuda and Spanish mackerel (Cooper, 2012; Rodrigues, Motta, Whittington and Schleyer, 2000).

The Primeiras and Segundas Archipelago is a chain of ten sparsely inhabited barrier islands and two coral reef complexes situated in the Indian Ocean off the coast of Mozambique and near the coastal city of Angoche. The eastern sides of the islands are fringed with coral reefs, composed mainly of soft corals, with hard corals at their southern edges. Beds of seagrass are situated between the islands and the mainland, which are an important habitat for sea turtles and dugongs (Rodrigues et al., 2000). The most popular islands are the Matemo and Vamizi Islands, boasting undersea mountainous escarpments and plateaus (Cooper, 2012).

Central Mozambique

The central coast lies between the Pebane and Bazaruto Island archipelago, a distance of 950 km, and is characterised as a swamp coast. A large number of rivers (24) discharge a high rate of sediment into the Indian Ocean which support estuaries and mangroves (Rodrigues et al., 2000). Figure 2.10 illustrates the coral reefs of the central Mozambique coastline.

The Bazaruto Archipelago in Mozambique comprises a group of six islands situated near the mainland city of Vilanculos. It comprises the islands of Bazaruto, Benguerra, Magaruque, Banque, Santa Carolina and Shell and Nyati. These fringing coral communities dominate the area. Dugongs and turtle species are often sighted, making the Bazaruto archipelago a very popular dive tourist destination (Cooper, 2012; Rodrigues et al., 2000).

Inhambane is located in Inhambane Province in the southern coastal region of Mozambique, stretching from the Bazaruto archipelago in the north to the Tofo peninsula in the south. Although not protected, it is a very popular dive tourist hotspot, often attracting visitors from all over the world who come to see a variety of fish, including shark species, pelagic fish and reef fish. Fringing reefs close to the shore and patch reefs are scattered along the coast (Cooper, 2012; Rodrigues et al., 2000).

Southern Mozambique

This area stretches for 850 km from Bazaruto Island southwards towards Ponta do Ouro. The distribution of reefs along the coast and near-coast islands are characterised as patchy reefs

with scattered corals (Rodrigues et al., 2000). Figure 2.11 illustrates the coral reefs of the southern Mozambique coastline.

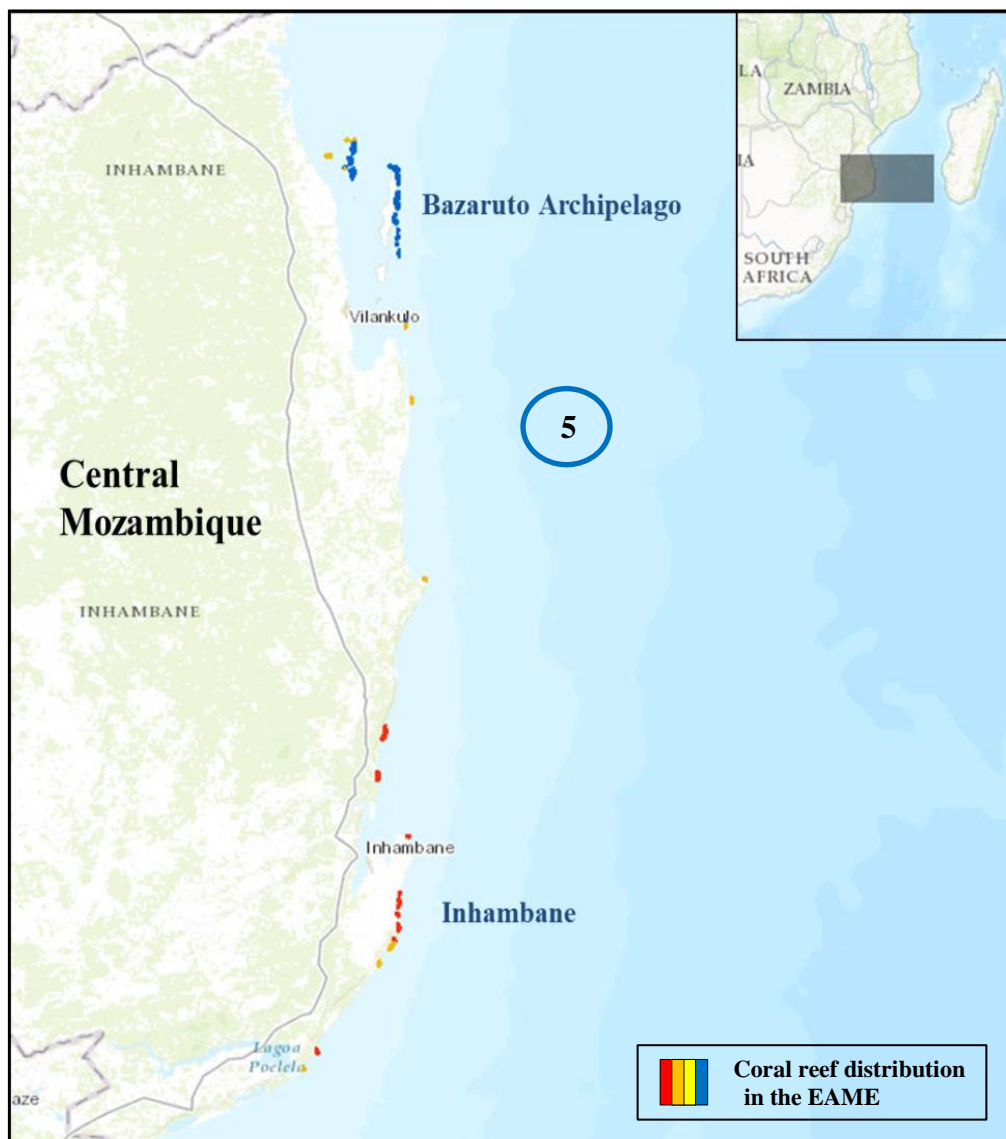


Figure 2.10: Coral reefs along central Mozambique

Source: Burke et al. (2011).

Inhaca and Portuguese islands are located 35 km from Maputo. Three small, shallow water fringing reefs occur along the shores of these islands with a combined length of 3.5 km. The reefs of Inhaca and Portuguese islands are popular tourist attractions. Cruise ships from South Africa disembark tourists onto the islands for their warm, clear waters which offer great diving and snorkelling (Cooper, 2012; Rodrigues et al., 2000).

Ponta do Ouro in southern Mozambique offers a wide array of underwater adventures. Very popular with divers from South Africa, the area is a haven for dive enthusiasts interested in

diving on subtropical reefs, shark diving, snorkelling and free diving activities. Four species of turtle are found but only the Loggerhead and the Leatherback turtles are reported to nest along the sandy beaches (Cooper, 2012; Rodrigues et al., 2000).

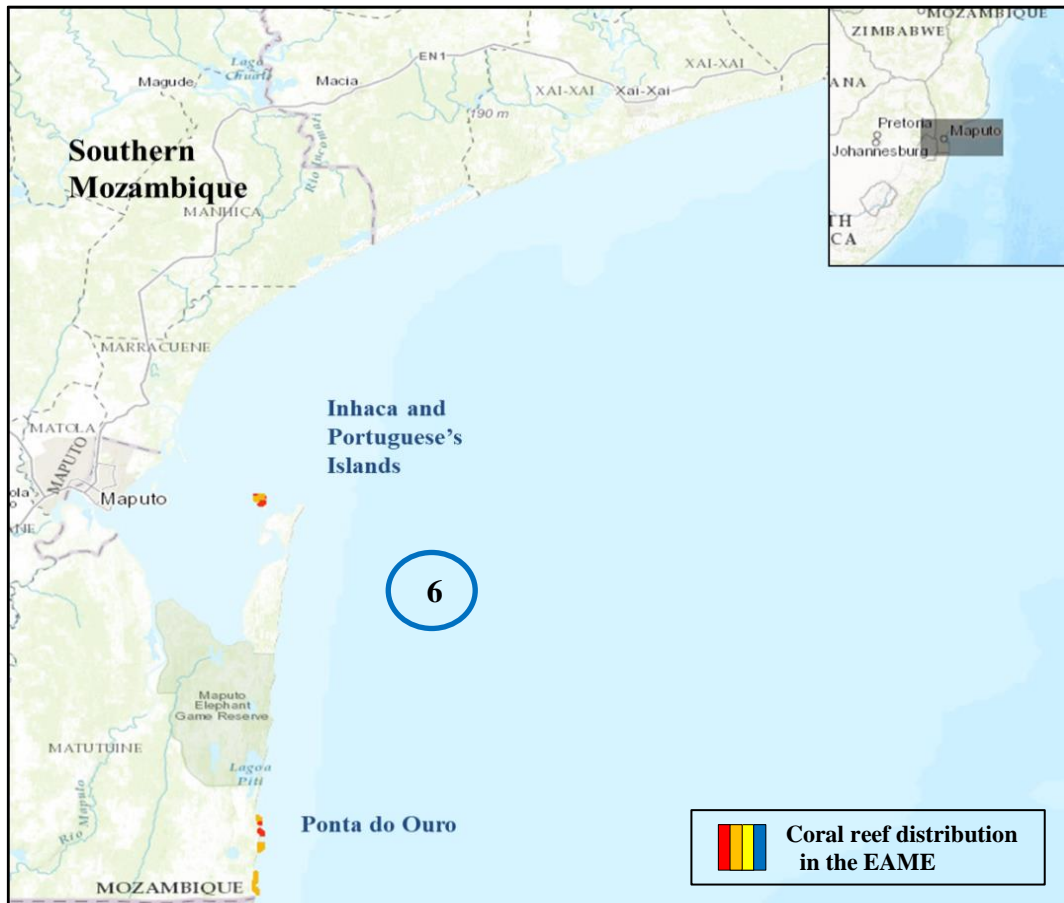


Figure 2.11: Coral reefs along southern Mozambique

Source: Burke et al. (2011).

2.3.3.4. South Africa

In South Africa, the warm Agulhas Current, which flows from the tropical waters of the Mozambique Channel, creates a favourable environment for coral reefs, making the coastline of South Africa a major attraction for international as well as domestic dive tourists (Heileman et al., 2009). South Africa's prime dive tourism destination is Sodwana Bay, attracting 60 000 to 80 000 divers per year since 2005 (Lucrezi et al., 2013; Mograbi and Rogerson, 2007).

Sodwana Bay. The Maputaland and St Lucia coastal regions are linked to each other to form a continuous reef stretching 150 km from the Mozambique border southwards to Cape Vidal and three nautical miles out to sea (Wey, 2016), forming part of the iSimangaliso Wetland

Park. The regions are made up of three reef complexes: the north, central and southern reef complex. Coral composition of the entire reef complex is a mix of hard and soft corals with high species diversity (Celliers and Schleyer, 2008). These high latitude reefs are the southernmost in Africa (Celliers and Schleyer, 2008). Figure 2.12 illustrates the coral reefs of South Africa’s north-eastern coastline.

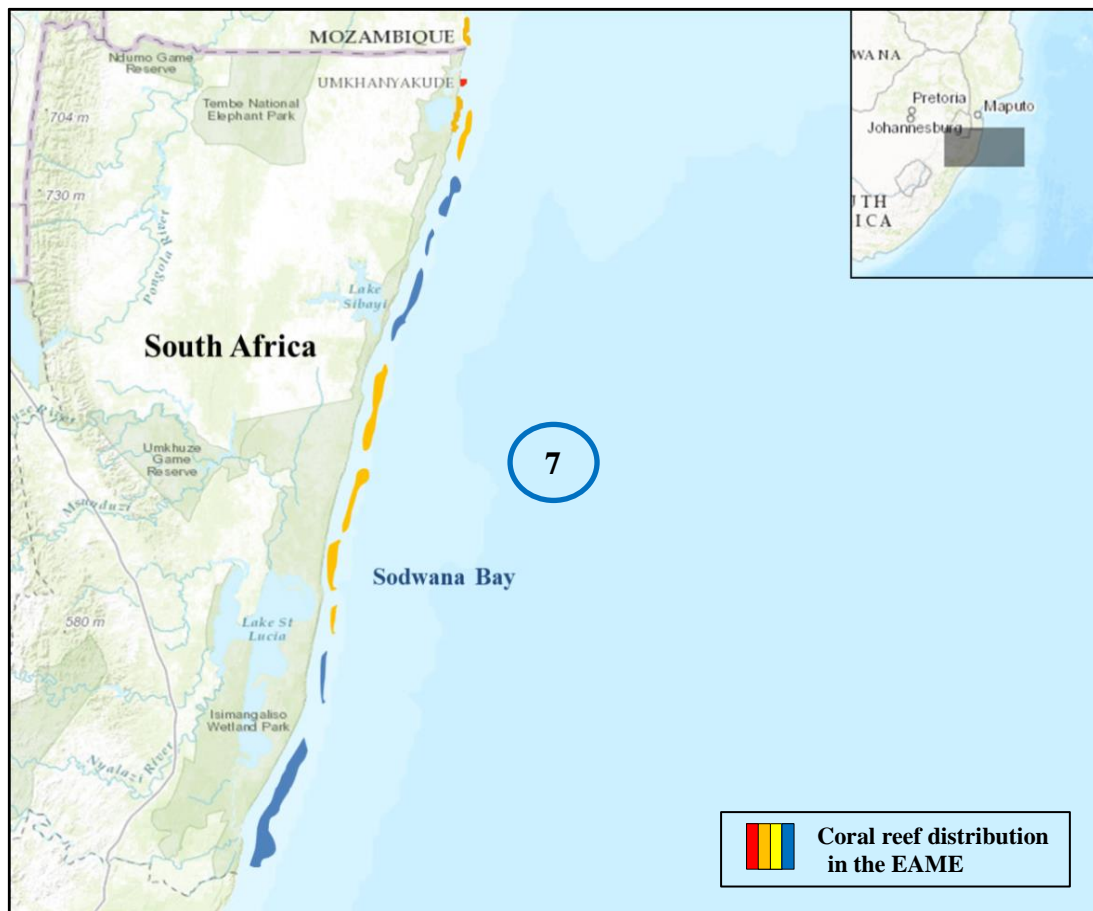


Figure 2.12: Coral reefs along north-eastern South Africa

Source: Burke et al. (2011).

2.3.4. Coral reef morphology in the EAME

Understanding the coral reef structure, geographical distribution and morphology within the marine tourism management context is important as it provides the background to the scuba diving industry in the EAME, and sets the scene for further discussion of the impacts that external risks may have on coral reefs and their ecosystems.

The most common reef zones, which typify reefs in the EAME, are distinguished as fringing reefs and have the following characteristics: inner reef or reef lagoon, reef flat, reef crest, and

outer reefs (Arthurton, 2003; Spalding, 2001). Reefs of this type are common along the shores of East Africa and the WIO islands, (Spalding, 2001). Figure 2.13 illustrates the composition and structure of fringing reefs.

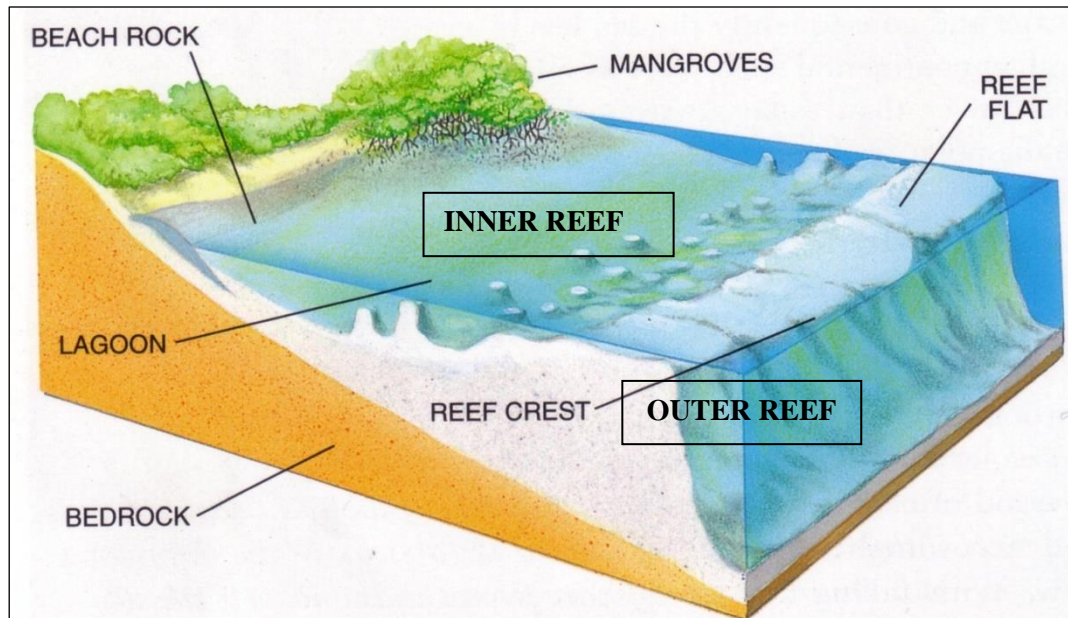


Figure 2.13: Diagram of a fringing coral reef

Source: Adapted from: Moyle and Cech (2004) and Arthurton (2003)

Fringing reefs run parallel to the coastline and are often confined to a narrow continental shelf following the contours of the mainland. They are found predominantly in Kenya and Tanzania and along the region's southern margins in southern Mozambique and north-eastern South Africa (Branch, Griffiths, Branch and Beckley, 2010; Celliers and Schleyer, 2008; Richmond, 2011; Schleyer, 1999; Schleyer and Celliers, 2003; Spalding, 2001). Similarly, the northern edge of the region ends along the eastern coast of Somalia where coral growth again becomes highly restricted by cold water upwelling associated with regional patterns in oceanic currents (Spalding, 2001).

2.4. Conclusion

Chapter 2 discussed dive tourism in the EAME in the context of the marine tourism industry and the SDTS. The marine tourism industry is an integral part of the tourism economy in EAME countries. As tourism growth is expected to continue on the African continent, these countries are well poised to benefit from increased demand for marine-based recreational tourism. SDT forms a major component of this. Section 2.2 introduced SDT in relation to coral reefs and dive tourism; destination image and attractions; diver demographics; and the

economic value of coral reefs. It also presented the SDTS and its relevance to the socioeconomic construct of the marine tourism industry, highlighting the key stakeholders that make up the SDTS. SDT in the EAME was discussed in Section 2.3 and consisted of tourism growth, dive tourism hotspots and coral reef distribution in the EAME. The section concluded with a brief examination of coral reef morphology in the EAME. An overview of external risks in the scuba diving industry is presented in Chapter 3.

CHAPTER 3

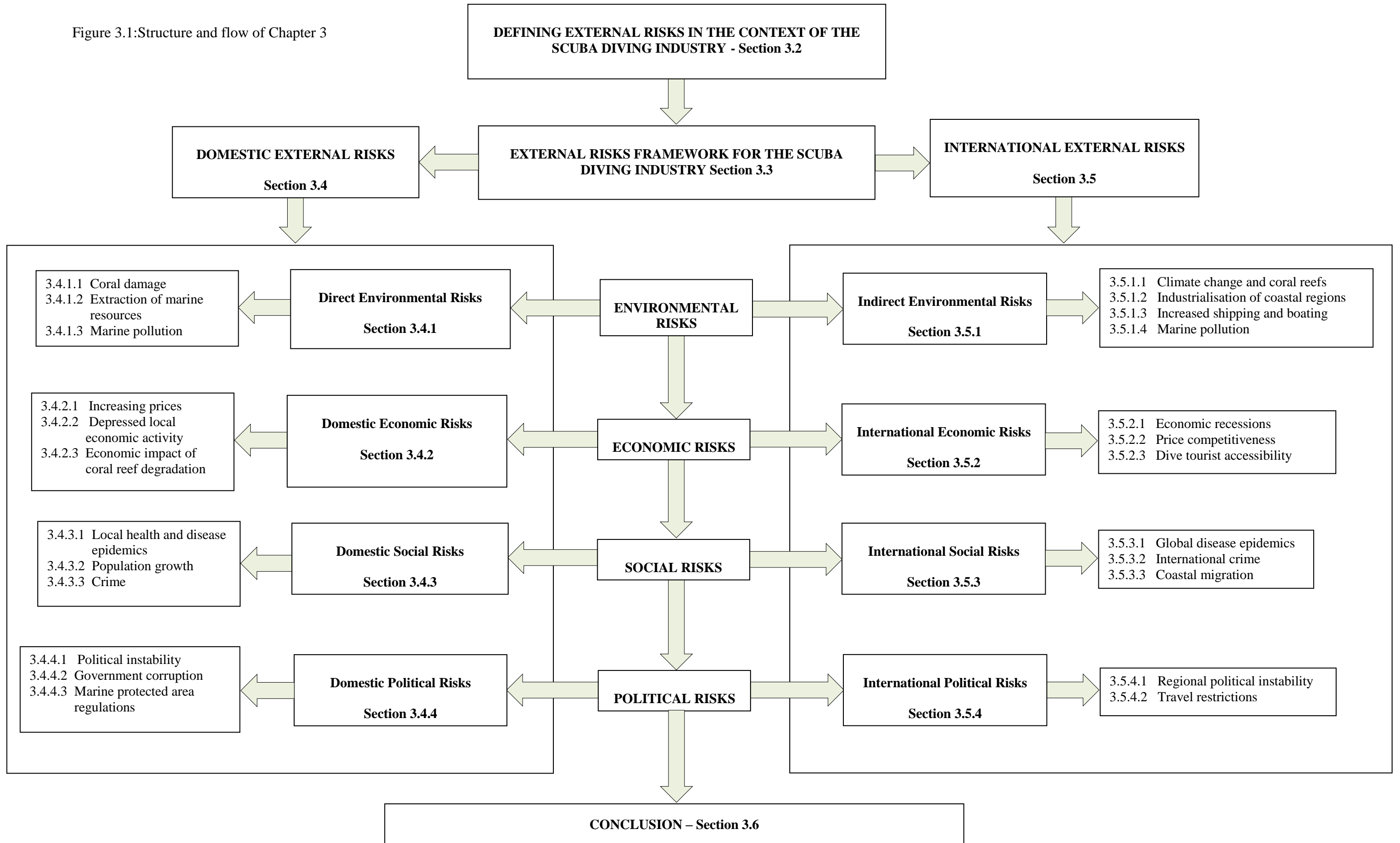
OVERVIEW OF EXTERNAL RISKS IN THE SCUBA DIVING INDUSTRY

3.1. INTRODUCTION

Although tourism is often regarded as an economic advantage for financially depressed countries, it brings with it many complex problems which can potentially have a major impact on local and regional environmental and socioeconomic status (Richmond, 2011). The tourism industry is made up of a number of attractions and businesses, and collectively all these businesses at a destination will experience a variety of risks (Shaw et al., 2012). Internal risks will affect an individual tourism business, but it can manage its own operational risks (Shaw, 2010). External risks are considered to be those risks that are beyond the control of management, for example natural disasters, economic recessions, political instability and disease epidemics. External risks affect not only individual businesses but can have an impact on the region as well as influence the entire tourism sector (Kaplan and Mikes, 2012; Shaw et al., 2012). Mayaka and Prasad (2012) state that there are a number of risks that undermine tourism growth in African countries. These risks also have the potential to affect the dive tourism industry.

Chapter 3 will explore the external risks which have an impact on the scuba diving industry in the EAME. The contents of this chapter are gleaned from existing literature. The literature in Chapter 3 is a required part of the study which is used to substantiate the findings and address the research problem in subsequent chapters of this study. Section 3.2 will define the concept of ‘external risks’ in the context of the scuba diving industry. Section 3.3 introduces a conceptual framework of external risks in relation to the scuba diving industry. The conceptual framework subsequently sets the scene for the discussion of domestic and international risks in Sections 3.4 and 3.5 respectively. Both of these sections are divided into four areas which cover each of the external risks under their respective risk categories (environmental, economic, social and political). The chapter will conclude with Section 3.6. Figure 3.1 illustrates the structure and flow of Chapter 3.

Figure 3.1: Structure and flow of Chapter 3



3.2. DEFINING EXTERNAL RISKS IN THE CONTEXT OF THE SCUBA DIVING INDUSTRY

In Chapter 2, it was stated that SDT has grown in popularity over the years and is one of the main forms of marine recreational activity in the EAME. Scuba diving activities are centred on pristine coral reef environments and are a major drawcard for dive tourists who visit the region. Coral reefs are a rare habitat and can therefore hold a high value for host countries in the form of ecosystem services, and various stakeholders are required to collaborate for the SDTS to be successful. However, there are risks which can disrupt the SDT system and, hence, the industry. While few external risks outlined in this chapter are specific to the scuba diving industry, there are a number of external risks that will be discussed that deal with tourism risks in general, but which also apply to the scuba diving industry.

External risks arise from events outside the tourism business that are beyond its influence or control, and can be attributed to natural and political disasters, and both socioeconomic and macroeconomic shifts (Kaplan and Mikes, 2012). Research has highlighted the fragility of ecosystems used for tourism and has noted the importance of ongoing assessment of ecological, social and economic factors to inform discussions on the sustainability of coral reefs and the services they offer (Christ et al. 2003; Hawkins and Roberts, 1993; Lacitignola, Petrosillo, Cataldi and Zurlini, 2007; Milazzo, Chemello, Badalamenti, Camarda and Riggio, 2002; Dimmock and Musa, 2015; Valsamakis, Vivian and Du Toit, 2004). The scuba diving industry is susceptible to risk like any other industry. Over the years, risks in the tourism industry have grown, adding to the multiple aspects that tourists have to consider before planning their travels to a destination (Shaw, 2010). Risk is seen as the potential loss or harm to a person, group, organisation, a system or a resource (Raval and Fichadia, 2007). Kuratko and Welsch (2001: 212) define risk as “the degree of uncertainty and the possible potential loss that can be associated with the outcomes from a given behaviour or set thereof”.

Africa’s business environment has traditionally been at the forefront of discussions on risk. A survey conducted by Aon (2015) shows that for the hotel and hospitality industry, weather and natural events, damage to reputation or brand, and property damage were the top three risks. The study also cited the top three risks predicted for the next three years to be political risks, economic slowdown and slow recovery, and failure to innovate or meet customer needs (Aon, 2015). The results of Aon’s survey provide a clear indication of why African risk managers are concerned about the impact of these risks on the tourism industry both currently

and in years to come. It again highlights the importance of a deeper understanding of the external risks that have an impact on the scuba diving industry.

3.3. EXTERNAL RISKS FRAMEWORK FOR THE SCUBA DIVING INDUSTRY

The concept of external risks was introduced in Sections 1.5.6 and 3.1. According to Saayman and Snyman (2005), external risks can be divided into two groups: domestic and international risks. Domestic risks occur within the borders of the host country and are any risk that may have a detrimental effect on a tourism business, in this case, scuba diving operators. These risks are present at the destination (Shaw et al., 2012) and influence their immediate tourism environment. International risks are risks that occur outside the borders of a country but still have an effect on the host country (Shaw, 2010), which ultimately has an impact on the scuba diving industry, scuba diving suppliers and dive operators.

For the purposes of this research, **domestic risks** refer to those risks that occur at the destination and which have an impact on SDT businesses within the borders of the EAME countries (Kenya, Tanzania, Mozambique and South Africa). **International risks** will refer to those risks present in the global and/or regional context which have an impact on these SDT businesses. In the case of environmental risks, domestic risks are referred to as **direct risks**, and international risks are referred to as **indirect risks**. This is because classifying them as domestic or international risks is not comprehensive in explaining their causality or connection with the underlying risk. All the above-mentioned risks fall under external risks.

To support the formulation of the conceptual framework, the researcher undertook to research the available literature on existing risk models. This was done to gain an understanding of what external risks were present in the dive tourism industry and which of these risks would potentially have an impact on scuba diving operators in the EAME region.

Thus, a conceptual framework for the dive tourism industry has been developed which considers dive tourism related external risks which are borne from crises relevant to the scuba diving industry. Three models were combined from Henderson (2007), Shaw (2010) and Dimmock and Musa (2015) to create the conceptual framework for the dive tourism industry:

- According to Henderson (2007) tourism risks can be classified on the basis of the factors attributed to their cause. The causes of what are referred to as ‘tourism

crises' can be attributed to economic, political, social and environmental domains (Henderson, 2007).

- Shaw (2010) developed a risk management model for the tourism industry in South Africa. It takes into consideration domestic (internal and external) and international risks (external).
- As presented in Section 2.2.5, the SDTS incorporates the marine environment, scuba divers, the host community and the scuba diving industry. Collectively, these four elements are interdependent on each other for the sustainable growth of the dive tourism industry (Dimmock and Musa, 2015).

The framework below combines the three models by representing the SDTS at its centre (Dimmock and Musa, 2015); the environmental, economic, social and political aspects of tourism risks (Henderson, 2007); and drawing from Shaw (2010), the division into domestic external risks and international external risks. The resultant conceptual framework, presented in Figure 3.2, classifies external risks to the scuba diving industry into four categories: environmental; economic; social; and political, and indicates their influence on dive tourism businesses from a domestic and international external risk perspective.

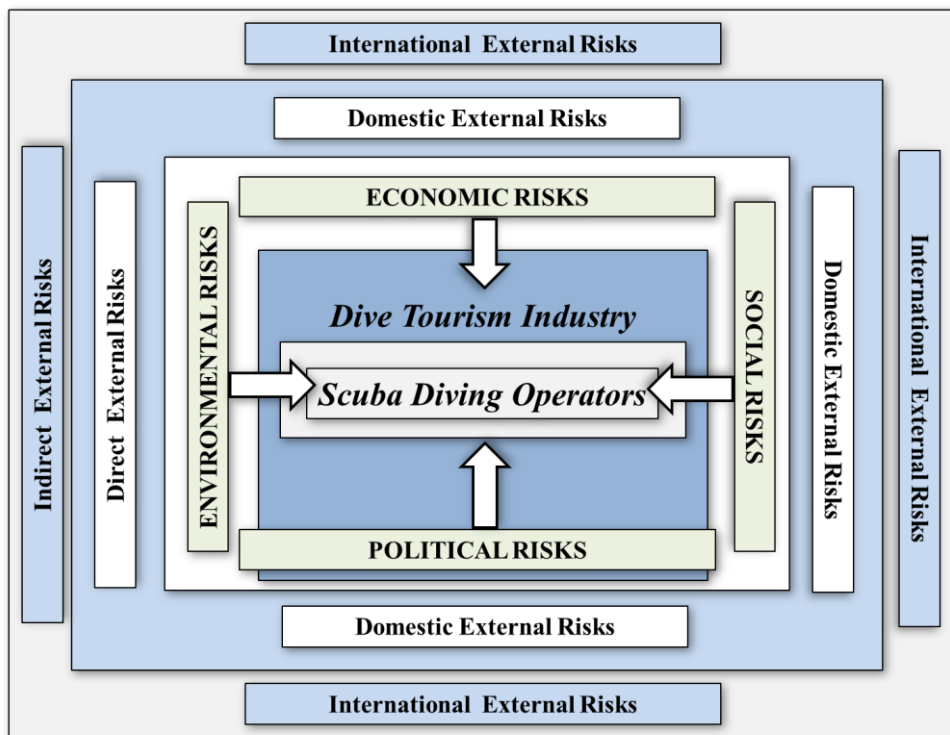


Figure 3.2: Conceptual framework of external risks: flow of domestic and international risks on scuba diving operator businesses

Source: Adapted from Henderson (2007:4), Shaw (2010:201) and Dimmock and Musa (2015:53).

This framework captures the various risk categories that are discussed in this chapter. Section 3.4 will discuss the direct/domestic external risks (Table 3.1), and Section 3.5 will discuss the indirect/international external risks (Table 3.12). In Sections 3.4 and 3.5, the individual external risks identified in the literature will be discussed per risk category in the following order:

1. Environmental external risks
2. Economic external risks
3. Social external risks
4. Political external risks

3.4. DOMESTIC EXTERNAL RISKS

Local or domestic risks which occur within the country’s borders have a negative impact on the local tourism industry (Shaw, 2010). When negative news reports are published on incidents of a political, social or economic nature, they can affect the image of a country or region. In the EAME specifically, there have been reports over the years of violence, corruption, crime, political instability and signs of weakening economies. Each of the individual domestic external risks are categorised into the four risk categories and will be discussed further in the sections described in Table 3.1.

Table 3.1: Domestic risk categories

Direct/Domestic External Risk Categories	Section
Direct environmental risks	3.4.1
Domestic economic risks	3.4.2
Domestic social risks	3.4.3
Domestic political risks	3.4.4

3.4.1. DIRECT ENVIRONMENTAL RISKS

Environmental risks are any risks that cause an unnatural change to the environment as a result of human-induced or natural events or processes over time (Anthony and Marshall, 2009). A direct risk in the environmental context is any direct impact on a natural ecosystem (Anthony and Marshall, 2009). Direct human-induced impacts on coastal ecosystems specifically on or around coral reefs have a negative effect on these marine environments.

This affects the industries and communities reliant on them for their survival (Burke et al., 2011).

Based on recent studies, direct environmental impacts such as coral mining, construction of ports and harbours, tourism overuse and coastal development account for most of coral reef degradation (Burke et al., 2011; Richmond, 2011). In East Africa, most documented damage to coastal habitats occurs near major towns and cities, due to sewage discharge, overexploitation of marine resources and marine pollution. Destructive fishing and agricultural runoff also pose significant threats (Bryant, Burke, McManus and Spalding, 1998). According to Burke et al. (2011), 65% of reefs in the Indian Ocean are at risk from local threats. Along continental shores, especially near urbanised coastlines such as Kenya and Tanzania, 90% of reefs are under threat. Figure 3.3 provides a map illustrating the coral reef degradation along the EAME (Burke et al., 2011). The map indicates all types of coral reef degradation. The colour scale helps to illustrate the level of degradation.

Any change to the environment for dive tourists may affect the destination image and be a risk to future tourism opportunities for scuba diving operators (Paterson et al., 2012; Uyarra et al., 2009). In addition to the reduction in biodiversity, the degradation of a marine environment such as a coral reef and its surrounding marine ecosystems could “seriously undermine local tourist revenues, a key source of foreign exchange” (UNODC, 2013:29). Table 3.2 shows the direct environmental risks that will be discussed.

Table 3.2: Direct environmental risks

Risk Category	External Risk	Section
Direct environmental risks Section 3.4.1	Coral damage	3.4.1.1
	Extraction of marine resources	3.4.1.2
	Marine pollution	3.4.1.3

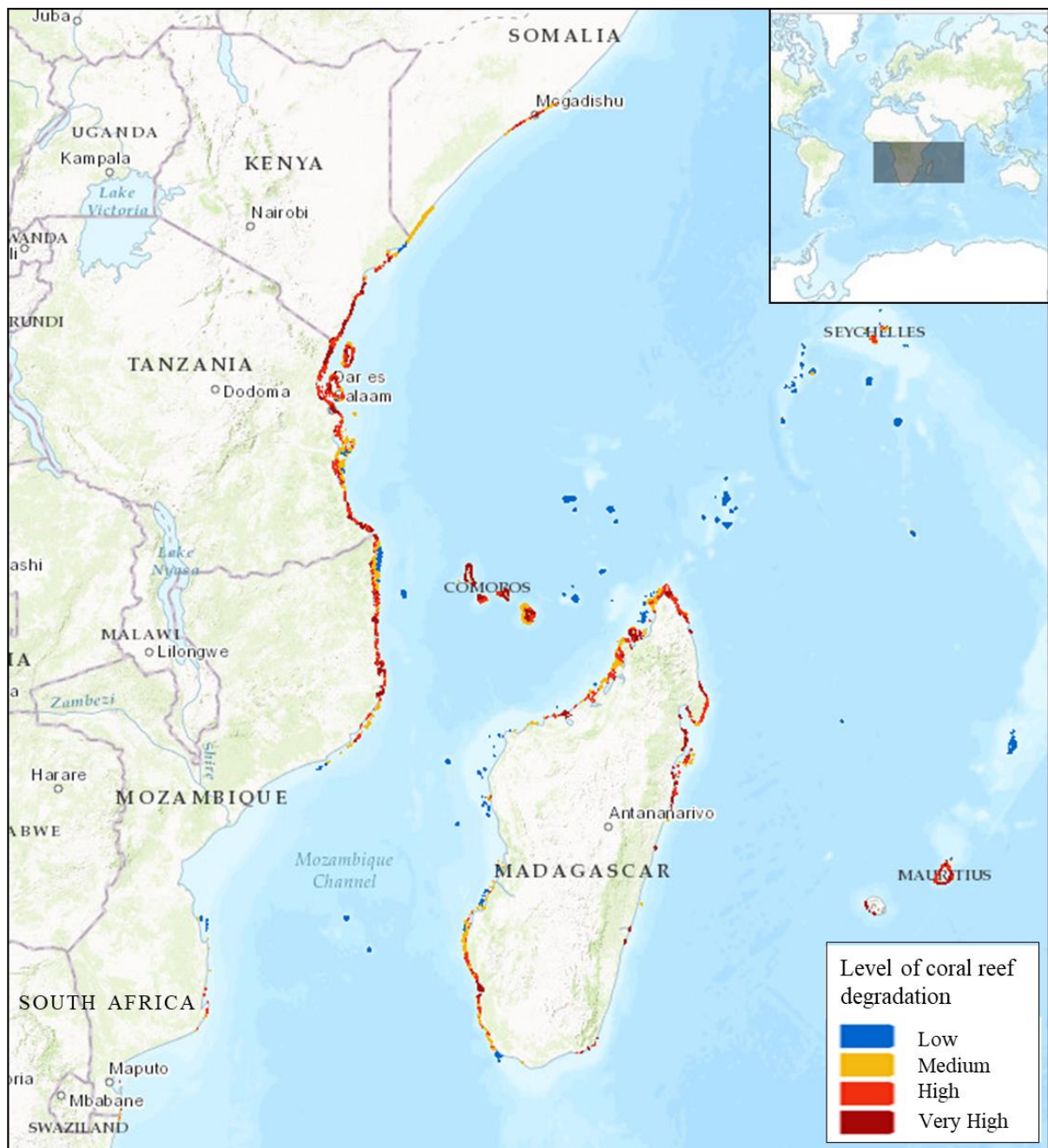


Figure 3.3: Level of coral reef degradation along the coast of East Africa and the Western Indian Ocean (WIO)
 Source: Burke et al. (2011).

3.4.1.1. Coral damage

Coastal development. As tourism is growing in the WIO and East African coastal region it has become an important economic sector, attracting over three million visitors per year (Richmond, 2011). In southern and eastern Africa, much of the population lives within two kilometres of the coast, and this population is expected to double in the next 50 years, making coral even more susceptible to development pressures (Moore and Best, 2001). The rapidly expanding coastal and marine tourism industry has seen large investments in coastal

developments to cater for the high tourist demand. This has resulted in the construction of hotels, marinas, harbours, shops, sports facilities, and so forth. These rapid developments have had major effects on the coral reefs, on which the tourism industry depends, with 32% of coral reefs estimated to be threatened by coastal development worldwide (Bryant et al., 1998).

Over the past few decades the coastal zone has become urbanised in many countries surrounding the Indian Ocean (Souter and Linden, 2005). As global tourism continues to fuel growth in local economies it has in many cases proved to be environmentally unsustainable. Large infrastructure is built too close to fragile coastal ecosystems such as wetlands, seagrass beds and coral reefs to accommodate the increased tourism demand (Hinrichsen, 1998; 2011). Examples include the “clearance of mangrove forests for beach access, up-rooting of near-shore seagrass beds for the convenience of wading tourists, and the use of long-lasting pesticides in gardens and on beaches to control flies and mosquitoes” along fringing reefs in Kenya and Tanzania (Richmond, 2011:38).

Sedimentation. Sedimentation is caused by increased human activities related to mass tourism development, land reclamation, dust and the disposal of solid waste, sewage and sludge (Cesar et al., 2003). This has, among other things, increased turbidity thereby reducing the levels of the light needed by coral reefs for their growth and survival (Cesar et al., 2003; Christie and White, 2007). With development comes the construction of infrastructure close to shore, meaning that sediment and other pollutants are finding their way into ocean waters (ICRAN, 2010). Constructing coastal marinas, hotels and ports may change the habitat and negatively affect the ecology of the area (Richmond, 2011). Not only does this development produce harmful sediments, but some infrastructure development directly disturbs marine habitats (ICRAN, 2010).

While East African reefs have been considered pristine marine environments, rapid coastal development resulting from human population growth has seen a decrease in water quality as a consequence of destructive fishing methods, coral mining activities and coastal construction, resulting in a build-up of debris over coral reefs (Obura, 2005a).

Diver impacts. The aesthetic value of a dive site is found to be an important factor which influences the visitation rate of a dive destination. Diver impacts are common at highly concentrated diving locations and dive sites (Cesar et al., 2003; Dimmock and Musa, 2015;

Van Treeck and Schumacher, 1998). The dramatic changes in tourism demand have resulted from the environmental degradation of coral reefs as a result of diver negligence (Tapsuwan and Asafu-Adjaye, 2008). Environmental impacts on coral reefs that can be attributed to diving-related activities include the breaking of corals, raising of sediments, behavioural change and altered feeding habits of marine fauna, and disturbances caused by diving with marine mammals (Cesar et al., 2003, Curtin and Garrod, 2008; Lindgren et al., 2008; Van Treeck and Eisinger, 2008; Worachananant, Carter, Hockings and Reopanichkul, 2008). Highly dived coral reefs in places like Zanzibar Island and southern Mozambique have been negatively affected by unregulated and careless tourist boat anchoring, excessive scuba diving and snorkelling (Richmond, 2011).

Studies show that the level of impact exerted by divers can be attributed to two main causes. Firstly, novice divers are generally unaware of the consequences of their behaviour and make contact with coral reefs (Barker and Roberts, 2004; Salim, Bahauddin and Bahauddin, 2013; Ong and Musa, 2011). Findings by Hawkins, Roberts, Kooistra, Buchan and White (2005) show that most contact with coral by divers occurs at the start of the dive, as divers settle and become familiar with aquatic conditions. Ince and Bowen (2011) place buoyancy control as one of the most important factors relating to diver impacts on coral reefs.

Secondly, heavily dived sites can have a detrimental effect on coral reefs. High diver numbers on coral reefs has shown to degrade coral reef ecosystems. A study by Abou Zaid (2002) conducted in Hurghada, Egypt, estimated that the percentage of coral damage in correlation with the number of dives per year increases as the number of divers to a particular dive destination increases (increased carrying capacity). If this carrying capacity is exceeded, it has been shown to lead to coral reef degradation (Abou Zaid, 2002). Studies by Jury et al. (2004) indicate that scuba diving on one coral reef in southern Mozambique exceeded 10 000 dives per year. A recent study undertaken along the Maputaland and St Lucia Marine Reserves in South Africa has revealed that reef fish communities without the influence of human activity are thriving as opposed to the areas near Sodwana Bay where dive tourism-related activities are permitted (60 000 to 80 000 divers per year) (Floros, 2012; Mograbi and Rogerson, 2007; Walters and Samways, 2001). Floros et al. (2013:132) conclude that “human activities are affecting the southern African coral reef fish communities”. Studies in the Grand Cayman Islands (Tatalos and Austin, 2001) and the Similan Islands in Thailand

(Tapsuwan and Asafu-Adjaye, 2008) have also indicated that current levels of diving pressure on coral reefs are unsustainable.

Tourism overuse has had negative effects on coral reefs. Research suggests that diver behaviour is a key determinant in the degradation of marine ecosystems coupled with poor land-use practices and other marine-based social activities (Bangkok Post, 2016; BBC Report, 2016b; Lew, 2013; Lucrezi et al., 2013).

3.4.1.2. Extraction of marine resources

Overfishing. Overfishing is caused by an increasing demand for marine resources. At a subsistence level, those who are dependent on fishing to make a living are therefore finding it more challenging to meet their yields in the face of unregulated fishing practices which have reduced fish stocks (ICRAN, 2010). The oceans of developing countries in Africa and Asia are being plundered of all valuable fish and shellfish by deep-water fleets trying to supply the ever-increasing demand for seafood (Stokstad, 2006), with approximately 80% of fish stocks currently being fished unsustainably (FAO, 2008; FAO, 2014). With some 2.6 billion people around the world dependent on fish, the loss of fish stock numbers has serious implications for the future of food security and poor coastal and near-shore populations (Worm, Barbier, Beaumont, Duffy, Folke, Halpern, et al., 2006).

In the EAME region, fish and shellfish are a vital resource, providing about 75% of the protein in the diet of 40 million people (Richmond, 2011). The rising global demand for seafood is leading to the overexploitation of fish stocks in the oceans. Commercial fisheries are being utilised at their maximum yield, leading to unsustainable fishing quotas and collapsed fisheries (Stokstad, 2006; Worm et al., 2006). The state of fish stocks has declined dramatically since the 1950s, and if the trend continues it is likely that the oceans will be mostly depleted of fish by 2050 (Black, 2006). There are three main reasons for the massive decline of ocean fisheries: an almost exponential rise in the demand for seafood as a result of increased population size; an asymmetrical number of local and commercial fisheries fishing for what is left in the oceans; and the unregulated and poorly managed efforts leading to the failure of the entire fisheries industry (Worm et al., 2006).

As SDT is dependent on healthy marine environments to create the anticipated experience of high diversity richness, in areas where coral reefs have been overfished the appeal for scuba divers to visit these areas is reduced (Burke et al., 2011).

Destructive fishing. The rapid population growth and urbanisation in the coastal regions of the EAME has led to increased pressure on traditional inshore fishery resources, in some instances with destructive fishing practices resulting in the loss of large areas of formerly productive reef ecosystems (Richmond, 2011). Destructive fishing on coral reefs poses two major threats. The first is the destructive fishing methods, which use dynamite, cyanide and other methods that break up the fragile coral reef and destroy the habitat that fish and other marine life dwell in (Clarke, 2002; 2004; ICRAN, 2010). The other is that destructive fishing methods generally do not select or target particular fish species, and often result in younger or non-target fish being killed in the process (ICRAN, 2010; Richmond, 2011). Damaging the coral reef habitat on which the fish rely can also reduce the productivity of the area and affect the livelihoods of fishermen (ICRAN, 2010; Richmond, 2011). Destructive fishing has thus led to the degradation of coral reef habitats along the EAME coastline and wider WIO region (Obura, 2005; Richmond, 2011). The collapse of fish stocks follows, particularly in the food chain surrounding coral reefs, allowing them to be more vulnerable to alien invasive species since the apex predators have been removed from the marine ecosystems (Burke et al., 2011; McClanahan, Muthiga, Kamukuruc, Machanod and Kiambo, 1999).

Coral mining. In many coastal regions in the EAME, where coral reefs are easily accessible, living shallow-water corals and terrestrial fossil coral rock are used as sources of calcium carbonate which are baked in kilns to produce lime for use in the construction of homes and other structures (Richmond, 2011). Where fossil coral rock is inaccessible, or the tools needed to excavate it are lacking, living coral is often used. The removal of living corals is detrimental to biological productivity of shallow lagoons and bays, as the resulting changes in inshore current patterns exacerbate coastal erosion (Richmond, 2011). This illegal extraction and collection of living coral continues, particularly in Tanzania and Mozambique (Richmond, 2011).

Aquarium and live fish trade. The extraction and international trade in coral reef fish, live rocks and other reef organisms also contributes significantly to the decline and degradation of marine ecosystems (Lieberman and Field, 2001; UNODC, 2011). Coral reef species are traded in numerous international markets, with the demand for live coral reef animals coming from two main sources. The first and most widespread is the demand for reef fish and invertebrates for the aquarium industry, which supplies both private and commercial aquariums. Many coral reef fish species, including the scorpion fish, anglerfish, puffer fish,

angelfish, filefish, surgeon fish, damselfish and trigger fish, are exploited for the aquarium trade, significantly degrading the coral reef marine ecosystems (Kenya Marine Center, 2016; Kimani, 1995).

The second source is the market for live reef fish and invertebrates for sale at restaurants and markets in South East Asia and China (Richmond, 2011; UNODC, 2013). Fish mortality for the collection of live fish and invertebrates is extremely high (up to 50%) mainly due to transportation to their destination (Richmond, 2011). The regions from which these aquarium animals can be exported are limited by distance to the markets, the availability of suitable holding facilities and access to international air transport (Wabnitz, Taylor, Green and Razak, 2003).

Green and Shirley (1999) state that the quantity of live corals traded since 1985 has risen by over 10 times and extraction from the Indian Ocean constitutes more than half the global trade. Studies show that live coral exported from the South Pacific nation of Palau for the aquarium trade is sold at around US\$3 per kg compared to coral sold locally as construction material (US\$0.02 per kg) (Graham, 1996). The United States of America (USA), Japan and Europe import the vast majority of all reef fish and reef invertebrates from around the world, for the aquarium industry. The USA imports approximately two-thirds of the global trade, “exceeding eight million marine fish of more than 800 species” (Richmond, 2011:38).

Marine curio trade. Among the other coral reef materials which are extracted are exotic fish species, hard and soft corals, and marine invertebrates for sale as curios, traditional medicines and live marine ornamentals (Lieberman and Field, 2001; Richmond, 2011). The international trade in corals and coral reef species is contributing to the stresses on marine ecosystems (Lieberman and Field, 2001). A study conducted by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) found that 174 countries had traded (imported and exported) in corals and coral reef species between 1975 and 2012, with an estimated total of over 31 million kilograms of live and raw corals being extracted from the oceans (CITES, 2013). These figures do not take into account the coral species sold directly to tourists or consumed locally. Globally, the trade in coral peaked in 2010 and this trend is expected to continue (CITES, 2013).

Many different varieties of coral species, sea urchins, turtle shells and sea fans are also sold as souvenirs (Kimani, 1995; Richmond, 2011). Throughout the WIO region, the trade in large

gastropod shells and hard coral is commonly seen at roadside shell stands and shops (Richmond, 2011). Shells are also extracted for the production of buttons and the jewellery trade and also used for inlays in furniture (Richmond, 2011). The sale of shells and other organisms, mostly to tourists or shell collectors in the region, is resulting in a significant decline in marine biodiversity (Richmond, 2011; Wells, 1989). Gastropods, for example, perform an important role in the balance of life on reefs, and their mass removal is detrimental to the marine ecosystem (Burke et al., 2011; Richmond, 2011). “The absence of gastropods encourages populations of starfish and sea urchins to grow unchallenged” (Richmond, 2011:251).

Added to this is poaching and illegal trafficking in marine fauna and flora, which has serious implications for marine ecosystems and biodiversity (Agnew, Pearce, Pramod, Peatman, Watson and Beddington, 2009). Much of this trade is from developing countries, which contain most of the world's biodiversity (FAO, 2016). A report by UNODC (2011) states that the largest black market in wildlife products in East Africa is the illegal trade in marine wildlife. This market is estimated to generate an income of approximately US\$850 million by criminal organisations (UNODC, 2011).

3.4.1.3. Marine pollution

Industrial and municipal discharge of waste. An estimated 90% of all wastewater in developing countries is discharged untreated directly into rivers, lakes or the oceans (Corcoran, Nellerman, Baker, Bos, Osborn and Savelli, 2010). Such discharges are part of the reason why deoxygenated dead zones are growing rapidly in the seas and oceans. Currently, an estimated 245 000 km² of marine ecosystems are affected worldwide, affecting fisheries, people's livelihoods and the marine ecosystems (Corcoran et al., 2010; Gilbert, Mayorga and Seitzinger, 2008; Nyenje, Foppena, Uhlenbrooka, Kulabakob and Muwanga, 2010). Rapid hotel development accompanied by a rise in local population to service the tourism industry creates serious problems with sewerage and waste, attracting pests such as flies and rats. These are usually exacerbated by the lack of infrastructure and relevant legislation in EAME countries (Richmond, 2011). Sewage from coastal developments, including tourist resorts, is the largest form of pollution with 80 to 90% disposed of in near-shore coastal waters without adequate treatment (Bryant et al., 1998; Corcoran et al., 2010). Industrial and agricultural activities leach toxic chemicals and heavy metals into coastal waters affecting human health as well as marine ecosystems (Corcoran et al., 2010). These toxins can “bio-accumulate up

the food chain over time and can result in reproductive, immunological, and neurological problems in both marine life and humans” (Hinrichsen, 2011:25).

Global surveys have revealed significant levels of disease outbreaks occurring in sites throughout the Pacific, Caribbean and Indian Oceans (ICRI/UNEP-WCMC, 2010). The frequency of coral diseases has increased significantly over the last ten years, causing widespread mortality among reef-building corals. Many scientists believe the increase is related to deteriorating water quality associated with human-made pollutants and increased sea surface temperatures (McClanahan, 2004). These factors may allow for the proliferation and colonisation of microbes (McClanahan, 2004), and evidence suggests that anthropogenic stressors are linked to coral disease (Breaking Waves, 2007; ICRI/UNEP-WCMC, 2010). In Zanzibar, for example, marine ecosystem services account for 30% of GDP (Naber et al., 2008), and the value of tourism alone is five times greater than the combined value of all the other ecosystem values and benefits (Corcoran et al., 2010). However, on this island, uncontrolled release of wastewater discharged into the marine environment is threatening water quality and ecosystem integrity and influencing fisheries and tourism (Lange and Jiddawi, 2009; Richmond, 2011).

Floating marine debris. Increasing coastal population density is compounded by the influx of tourism and the popularity of the natural environment among tourists. Such growth has led to the generation of enormous quantities of waste (WRI, 2008). Scientists have estimated that 80% of all marine pollution comes from land-based sources (WRI, 2008). Waste created by people living on or near the coast has had a serious impact on coastal resources and affected the destination image for tourists (Paterson et al., 2012).

Floating marine debris is comprised of any waste that is either thrown overboard from ships or disposed of inland and makes its way to the oceans (Burke et al., 2011; Richmond, 2011). This form of pollution is comprised mainly of various forms of plastic, fish netting and fishing gear (Burke et al., 2011; Richmond, 2011). The marine debris found floating in the oceans can become entangled with corals often causing death. Fine particles of plastic are often ingested by fish, birds and marine mammals and this problem has grown significantly over recent years, affecting the health of coral reefs (Burke et al., 2011; Richmond, 2011).

Eutrophication. The flow of nutrients into coastal waters from land-based sources has seen a worldwide increase over the last decades. Studies by Green, Vörösmarty, Meybeck,

Galloway, Peterson and Boyer (2004) and Hoekstra, Molnar, Jennings, Revenga, Spalding, Boucher, et al. (2010), using land surface runoff models, have calculated increased chlorophyll-a (green pigment which is responsible for photosynthesis in algae and plants) around coastal marine environments. This is attributed to coastal run-off predominantly as a result of agriculture, livestock, human sewage and atmospheric deposition sources of dissolved inorganic nitrogen (DIN). The resulting change in ocean water quality has many potential effects on coastal and marine ecosystems. Algal growth has increased globally to 75.6% from 1998 to 2007, indicating that eutrophication is increasing substantially (SEDAC, 2007).

Changes to nutrients entering oceans from land-based sources can create algal blooms that may smother the coral reefs. Compounding this problem is overfishing, which has resulted in the loss of algae-feeding fish species (Richmond, 2011). Algal growth causes decomposition of nutrients in the water thereby reducing the oxygen available to sea creatures like fish, shellfish and crustaceans, resulting in eutrophication. In extreme cases, eutrophication can lead to hypoxia, creating oxygen-depleted “dead zones” which kill coral reefs (Spalding, Fox, Allen, Davidson, Ferdaña, Finlayson, et al., 2007). Such events reduce the appeal for dive tourism.

3.4.2. DOMESTIC ECONOMIC RISKS

Tourism development increases foreign exchange income, creates employment opportunities, and stimulates growth in the tourism sector and overall economy (Lee and Chang, 2008). Research suggests that tourism has long-term economic benefits for countries, especially those whose main source of revenue is derived from tourism, contributing towards a county’s GDP (Brau, Lanza and Pigliaru, 2003; Dritsakis, 2004; Durbarry, 2004; Oh, 2005; Skerritt and Huybers, 2005). There can be no doubt that the tourism sector contributes positively and significantly to economic growth. Likewise, any negative economic disturbances will have a negative impact on the tourism industry and associated industry sectors (Lejarraja and Walkenhorst, 2007).

Given the positive relationship between tourism and GDP, an economic downturn can undermine tourism demand (Henderson, 2007). Developing countries with little ability to explore other resources have embraced tourism as a way to boost their economy. Overreliance on tourism, especially mass tourism, carries significant risks to tourism-dependent economies (Lejarraja and Walkenhorst, 2007). As tourism is not defined by a

single commodity sector but is dependent on a number of interrelated industries (food and beverage, furniture, textiles, construction, jewellery, transportation, communication, etc.), economic disturbances may ultimately affect industries that support the tourism sector (Henderson, 2007; Lejarraja and Walkenhorst, 2007). Negative economic effects that can influence the dive tourism sector include depressed local economic activity, increasing prices of goods and services and the economic impact as a result of degradation to the natural environment. Table 3.3 provides a list of the external risks dealt with in this section.

Table 3.3: Domestic economic risks

Risk Category	External Risk	Section
Domestic economic risks Section 3.4.2	Increasing prices	3.4.2.1
	Depressed local economic activity	3.4.2.2
	Economic impact of coral reef degradation	3.4.2.3

3.4.2.1. Increasing prices

High fuel prices. Increasing fuel costs affect the price of transport, which is a major component of tourism expenditure. They also affect the general price levels of all other goods and services in an economy (Lunogelo, Mbilinyi and Hangi, 2009; Yong, 2014). When the oil price rises, it inevitably causes fuel prices to increase, creating economy-wide effects. Increased fuel prices have the potential to create a negative tourism demand as tourists will experience a drop in disposable income. The result is that tourists generally take shorter holidays or seek alternative holiday destinations which are more affordable, usually in their own locale or within the borders of their own country. This results in decreased income for the tourism industry (Yong, 2014). Table 3.4 provides an overview of fuel prices over time for EAME countries. Years presented in the table are not sequential so as to provide a view of the fuel price trend over time.

Table 3.4: Fuel price growth in EAME countries (expressed in US\$)

	2017 ^a	2014 ^b	2012 ^b	2010 ^b	2008 ^b	2000 ^b
Kenya	0.95	1.21	1.37	1.33	1.20	0.7
Tanzania	0.89	1.29	1.31	1.22	1.11	0.75
Mozambique	0.94	1.55	1.58	1.11	1.71	0.6
South Africa	1.02	1.19	1.38	1.19	0.87	0.5

Source: a: Global Petrol Prices (2017); b: KNOEMA (2017a).

Wall and Mathieson (2006) refer to fuel price shifts as an economic indicator of the future of tourism. While influencing the entire economy, increasing fuel prices are passed on to the consumer. Developing countries tend to feel the cost of high fuel prices even more with exchange rate fluctuations, as they need to buy products that may not be present in the home country in order to maintain the high standards that tourists expect. For the dive tourism industry, this may relate to service parts, equipment for dive boats and scuba gear. Trends have shown that even when fuel prices drop, they do not necessarily translate to a drop in prices for goods and services, as is shown in Table 3.6 (Price Inflation).

Increasing interest rates. Interest rates can be defined as “the yearly price charged by the lender to the borrower in order for the borrower to obtain a loan” (Moffatt, 2002). Interest rates are presented as a percentage of the amount loaned and are usually determined based on the perceived risk assigned to the borrower. Various studies point to a negative relationship between interest rates and tourism activities. However, a positive relationship exists between interest rates and prices (Durberry and Sinclair, 2003; Dwyer, Forsyth and Rao, 2000; Gu, 1995). Lower interest rates are usually associated with lower prices and these include the amount a tourist will pay for products and services. For the dive tourist, these products and services would include the cost of accommodation, travel to the destination, food, beverages, dive gear hire, dive permits, and dive trips. Lower interest rates encourage tourism consumption, while higher interest rates may delay tourist consumption (Shaw, 2010). The real interest rate is the rate of interest an investor, saver or lender receives after allowing for inflation (Grishchenko and Huang, 2012; Reinhart and Sbrancia, 2011). Table 3.5 illustrates the real interest rates for countries in the EAME between 2010 and 2016.

Table 3.5: Real interest rates in EAME countries (expressed as a percentage)

	2016	2015	2014	2013	2012	2011	2010
Kenya	7.90	5.90	7.82	11.55	9.46	3.84	12.05
Tanzania	-	8.95	10.69	7.58	4.26	3.06	4.85
Mozambique	8.03	10.05	11.85	10.97	10.35	15.26	8.01
South Africa	3.43	4.21	3.17	2.22	3.29	2.32	3.27

Source: KNOEMA (2017b).

Price inflation. Inflation is measured by the consumer price index and reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as annually (Caraballo,

Dabús and Usabiaga, 2006). Inflation is calculated as a national average of all prices and may differentiate between the various types of products or services offered (Shaw, 2010). Price inflation is an increase in the average price of all goods and services. During inflationary periods, money loses purchasing power as each monetary unit buys fewer goods and services (Shaw, 2010). The primary risk in inflation is that the purchasing power will be eroded during the time that inflation occurs. Increasing costs of travelling in countries which have incurred inflation will reduce the amount of purchasing power for both international and local tourists (Yong, 2014).

The government’s aim is to keep inflation under control so as to avoid an uneven distribution of wealth, thus creating uncertainty in the market. Yong (2014) postulates that the effect of innovation on tourism demand can be outweighed by the effect of inflation costs. Yong (2014) also states that there is evidence that inflationary pressure is found to be a result of the improvement in the monetary policy, higher degree of trade openness and domestic currency appreciation. Table 3.6 shows the Consumer Price Index (CPI) from 2010 to 2016 for Kenya, Tanzania, Mozambique and South Africa.

Table 3.6: Consumer Price Index (CPI) for EAME countries (expressed as a percentage)

	2016	2015	2014	2013	2012	2011	2010
Kenya	6.30	6.58	6.88	5.72	9.38	14.02	3.96
Tanzania	5.17	5.59	6.13	7.87	16.00	12.69	6.20
Mozambique	19.85	3.55	2.56	4.26	2.68	10.35	12.70
South Africa	6.33	4.59	6.07	5.75	5.65	5.00	4.26

Source: KNOEMA (2017c).

Following the 2008 financial crisis, the price of oil and interest rates fell dramatically, leading to easing of inflationary pressures worldwide, creating an increase in disposable incomes as well as tourism expenditure (Conrady and Buck, 2010). While each sector of the economy may be affected differently by the rising cost of providing products and services, price inflation can disrupt the tourism economy of a country (Shaw, 2010).

3.4.2.2. Depressed local economic activity

A key concern among dive operators in the EAME has been the prolonged depressed economic activity in their economies which have impacted on their businesses. The effects of the 2008 global financial crisis for some countries in the EAME went largely unnoticed

because of the traditionally low levels of integration with the international financial markets. However, economic decline in the EAME countries soon followed (Lunogelo et al., 2009; World Bank, 2010b; WTTC, 2013; WTO and ILO, 2013). The result was a decrease in purchasing power of developing economies which began to manifest in terms of falling commodity prices, unemployment, decline in incomes and a drop in demand for commodities (Lunogelo, et al., 2009). The most negatively affected sectors were agriculture, industrial manufacturing, mining and tourism (Lunogelo et al., 2009). Table 3.7 illustrates the GDP growth for EAME countries. Years presented in the table are not sequential in order to provide a view of GDP per capita trend over time.

Table 3.7: GDP growth per capita in the EAME (expressed as annual % change)

	2016	2015	2014	2013	2012	2009	2008	2007
Kenya	3.2	3.0	2.6	3.0	1.8	0.5	-2.4	3.9
Tanzania	3.7	3.7	3.7	4.0	1.9	2.1	2.3	5.2
Mozambique	0.9	3.6	4.4	4.1	4.1	3.3	3.8	4.3
South Africa	-1.3	-0.3	0.1	0.9	0.7	-2.9	1.7	3.9

Source: KNOEMA (2017d).

The current concern for most **Kenyans** is the extent to which the contagion of the 2008 global financial crisis has affected the domestic economy (Wanjohi, 2011). Following the crisis, changes in monetary policy stance could not be sustained and what followed were increased inflationary pressures and unprecedented depreciation of the exchange rate (Were, Nyamongo, Sichei, Kamau and Wambua, 2012).

The GDP in **Tanzania** expanded to 5.70% in the first quarter of 2017, with an average of 6.72% between 2002 and 2017. Growth is still supported by government investments in infrastructure (railways, new roads and expanding ports), however, growth has slowed recently as a result of uncertainty over government policies and a slowdown in the private sector (Ng'wanakilala, 2017).

After many years of strong growth and stability, **Mozambique's** projected slowdown in 2016, reflects continued decline in commodity prices for key exports, negative effects of the ongoing drought on agricultural production and further fiscal tightening (World Bank, 2016a). This outlook is subject to additional downward risk if investments are deferred and if rising debt levels result in sharper policy adjustment. Further currency depreciation is likely

and will continue to add to inflationary pressures, impacting on economic growth (World Bank, 2016a).

South Africa faces continued economic and political uncertainty. According to the World Bank (2016b), South Africa's economy fell into a recession as its growth forecast was reduced to 0.8% for 2016. Growth in South Africa's economy has been under pressure following a slump in commodity prices, weakening demand from China and the worst drought in more than a century. The rand has plunged 14% against the dollar since 2014 as sentiment worsened and credit-rating companies downgraded the nation's debt because of growth risks in 2017. Volgraaff (2016) stated that any further foreign rating downgrades will "trigger higher borrowing costs, capital outflows, and risk a recession with knock-on implications for poverty reduction and possibly social stability in the longer term". However, Shadow Minister, David Maynier, stated that "the reality is the economy, which is set to grow at just 0.5% this year, is growing too slowly to increase the level of per capita income for the 30.4m people living below the poverty line", indicating that GDP growth is still a long way from economic recovery (Africa, 2017; StatsSA, 2015).

3.4.2.3. Economic impact of coral reef degradation

The development of tourism destinations has a beneficial economic impact on the tourism industry at the destination (Shaw, 2010). Research shows, however, that unregulated tourism development and the use of excessive marine recreational activities can negatively alter and degrade the natural environment (Hawkins et al., 2005). There is also evidence to suggest that the more popular a tourist destination becomes, the higher the risk of environmental degradation to the ecosystem that attracts visitors to that destination (Butynski and Kalina, 1998).

Coral reefs have multiple economic functions which provide goods and services (See section 2.2.4). Direct economic benefits of coral reef use for tourism activities are quantifiable through their resource use, such as fish habitats for the fishing industry and the tourist attraction function for the tourism industry. When additional uses of coral reefs are added, such as coastal development and overfishing, the benefits derived from coral reefs decrease (Berg, Óhman, Troêng and Lindén, 1998; Cesar et al., 2003; Ríos-Jara, Galván-Villa, Rodríguez-Zaragoza, López-Uriarte and Muñoz-Fernández, 2013; Ruitenbeek, 1999). Monetary losses occur when coral reefs are damaged as a result of human activities (e.g. tourism overuse, marine pollution, etc.) or as a result of major climatic events (severe

hurricanes, El Niño, etc.) by reducing their economic function and ability to provide goods and services (Cesar et al., 2003; Berg et al., 1998; Wallace, 1993).

3.4.3. DOMESTIC SOCIAL RISKS

Domestic social risks may directly affect scuba diving operators and the scuba diving industry in the East African region. Socioeconomic changes are a key influence on both demand and supply in the tourism industry (Henderson, 2007). Social conditions at tourism destinations may create conflict owing to increased population densities and shifting socio-cultural demographics to make way for tourism demands (Burgoyne et al., 2018; Henderson, 2007). Population growth along the coast brings with it health epidemics, crime, unemployment and additional demands on marine resources (Burke et al., 2011; Richmond, 2011). Developing countries such as those in the EAME may not have the capacity to deal with social changes as readily as advanced economies. Table 3.8 shows the individual domestic social risks which will be discussed in more detail.

Table 3.8: Domestic social risks

Risk Category	External Risk	Section
Domestic social risks Section 3.4.3	Local health and disease epidemics	3.4.3.1
	Population growth	3.4.3.2
	Crime	3.4.3.3

3.4.3.1. Local health and disease epidemics

Tourism is a major source of revenue for many African countries, especially Kenya and South Africa, but potential visitors appear increasingly hesitant about travelling to African countries which are home to some of the deadliest and most easily transmittable diseases. Disease is a hidden factor preventing the exponential growth of worldwide tourism, acting as a hindrance to tourism flows and mass development (Strielkowski, 2014). Some of the diseases prevalent in East African countries are malaria, HIV/AIDS and food and water-borne diseases, which will be briefly discussed.

Malaria. Malaria affects 225 million people around the world, causing 781 000 deaths each year across 106 countries (WHO, 2015). Africa carries 90% of the burden which mainly affects children under five years old and pregnant women. The disease consumes up to 40% of public health expenditure in high transmission areas. Africa alone suffers US\$12 billion in

lost GDP every year as a result of malaria (Kitua, Ogundahunsi, Lines and Mgone, 2011). East Africa's transmission rates have shown a decline of between 50 and 75% in many areas including Tanzania, Kenya and Mozambique, and a decrease of more than 50% in southern African countries (Maartens, Sharp, Curtis, Mthembu and Hatting, 2007; WHO, 2015). While there was a significant decline in malaria cases between 2000 and 2014 (WHO, 2015), the risk of a resurgence in the epidemic is possible owing to increased rainfall resulting from changes in weather (as a result of climate change) (Tanser, Sharp and Le Sueur, 2003; Kelland, 2014).

HIV/AIDS. HIV/AIDS has had a negative impact on world tourism. In 2014, 36.9 million people were living with HIV (UNAIDS, 2015). The United Nations reported that, in 2005, southern Africa experienced the highest rate of HIV infection in the world (UNAIDS, 2013). The infection rate was particularly high among people aged 15 to 49. This age group constitutes the part of the population that is economically active, with some working directly or indirectly in the tourism sector (Ketshabile, 2007). A study conducted by Ketshabile (2007) on the effects of the HIV/AIDS pandemic on tourism companies in southern Africa showed that HIV/AIDS affects the day-to-day running of their businesses; the tourism sector experiences the problem of workers going on lengthy sick leave due to HIV/AIDS; and the southern African tourism industry is losing experienced workers due to this pandemic.

Food-borne and water-borne diseases. The World Health Organisation (WHO) reports that outbreaks of food-borne and water-borne diseases result in a high number of illnesses and deaths around the world (Berman, 2009). Tourists are more susceptible to contracting diseases when travelling to countries with different climates and epidemiological characteristics than local populations (Vellas and Becheral, 1995), possibly because they do not have the same built-up immunities as local residents. Food and drinks are sometimes not prepared under strict hygienic conditions and often become contaminated with serious medical consequences for tourists (Keyser, 2009; Vellas and Becheral, 1995; Watson, Hlavsa and Griffin, 2016). More particularly, in areas with high endemism of cholera, typhoid, dysentery and hepatitis A (countries like the Caribbean, South America, Africa and Asia), care should be taken to prevent infection (Watson et al., 2016).

According to the Travel and Tourism Competitiveness Report 2015 (WEF, 2015), EAME countries rank highly in poor access to improved sanitation and drinking water. Tables 3.9

and 3.10 illustrate rankings for access to improved sanitation and access to improved drinking water, respectively.

Table 3.9: Access to improved sanitation in EAME countries

Access to improved sanitation – Ranking (out of 141 countries)			
Kenya	Tanzania	Mozambique	South Africa
125	139	133	91

Source: WEF (2015).

Table 3.10: Access to improved drinking water in EAME countries

Access to improved drinking water – Ranking (out of 141 countries)			
Kenya	Tanzania	Mozambique	South Africa
131	136	141	74

Source: WEF (2015).

The above tables show that health and hygiene are some of the main areas for improvement in the EAME countries if they are to limit food-borne and water-borne diseases (WEF, 2015). While countries in the EAME rank poorly, hygiene standards in resorts and hotels are generally considered to be high.

3.4.3.2. Population growth

Population growth along the world’s coastlines has grown dramatically over the last century. Over the past 50 years, this trend has accelerated, as rural economies atrophy, and more people migrate in search of access to basic services, employment and better opportunities (Hinrichsen, 2011). Countries in the EAME region have similarly experienced population growth along their coastline, with the entire Sub-Saharan African region experiencing the fastest growing population in the world (Creel, 2003; UNFPA, 2009; WRI, 2008). This is having a profound effect on coastal areas with heavy environmental and social consequences, as more impoverished local communities are migrating towards the coast for better opportunities (Dicken, 2014; Hinrichsen, 2011; Paula and Schleyer, 2009; Richmond, 2011; UN, 2011). The results of increased population growth include an increased dependency on marine resources, unemployment and associated social consequences (crime), each of which will be discussed in turn.

Increased dependency on marine resources. Coastal livelihoods are primarily dependent on coral reefs and the competing needs of increasing communities along the coastal zone has

never been greater (Burke et al., 2011; Richmond, 2011). The rapid growth in coastal populations has serious implications for coral reefs and their surrounding marine ecosystems. A problem facing many regions of the world, including East Africa, is the over-exploitation of natural marine resources (Richmond, 2011). Coral reefs are particularly vulnerable to over-exploitation and in some places their existence is seriously threatened (Richmond, 2011). Population growth and skewed distribution patterns are already straining coastal and near-shore environments owing to overuse throughout the continent, resulting in the degradation of valuable coastal ecosystems (Hinrichsen, 2011; UNEP/WCMC, 2003; World Bank, 2009). Rapid population growth and coastal urbanisation has also led to increased pressure on traditional inshore fishery resources resulting in the loss of large areas of formerly productive reef ecosystems (Richmond, 2011). This rapid growth has had a negative impact on the marine resources on which communities in neighbouring villages depend. Over the past two decades, fish consumption per capita in much of Sub-Saharan Africa has declined, while efforts to harvest fish have intensified (Burke et al., 2011; Richmond, 2011) (see Section 3.4.12). This is due mainly to a failure by governments to implement coastal management programmes, or to enforce effective fishing regulations (World Bank, 2009; Naber et al., 2008).

Unemployment. While East African economies are growing adequately by global standards, they are not creating enough jobs or making life significantly better for the region's poor. One of the key issues, Hofmeyer (2013) states, has been jobless growth. Growth has not been sufficiently translated into productive jobs, especially for the youth. Additionally, if economic growth is being driven by sectors that create limited employment, and the benefits of growth accrue only to a few, then high GDP growth provides little escape from poverty (Action Aid, 2003; Hofmeyer, 2013; Narayan, 2004; Whittingham, Campbell and Townsley, 2003).

These findings are consistent with a study by Haralambopoulos and Pizam (1996) who found that those in the tourism industry who are economically dependent on tourism have more positive attitudes towards the industry than those who are not dependent on it. Despite showing economic growth, the issue of inequality remains. South Africa is one example where if the proceeds are not shared equitably, the impact of rapid economic expansion may ultimately become more destructive for a society (Dicken, 2010; Hofmeyer, 2013).

The positive benefits that tourism can bring to local economies in terms of job creation, opportunities for small businesses and empowerment of local communities as a means for poverty alleviation have been recognised in a number of studies (Anderson and Juma, 2011; Mograbi and Rogerson, 2007, Rotarou, 2014). However, despite the efforts of governments, the tourism sector has few linkages to the local economy and therefore a limited impact on poverty (Grainger, 2013; Rotarou, 2014; World Bank, 2010a; ZANZINET, 2012). In reference to the tourism market in Zanzibar, Rotarou (2014:251) goes on to say that some of the reasons behind this failure include the “economic interests of wealthy investors and certain government officials, widespread corruption, and lack of policies connecting local communities with the tourism sector”. The findings of the study confirmed that tourism in Zanzibar has created an “enclave economy” or “islands of development” that are dependent on foreign capital and non-local labour (Rotarou, 2014).

3.4.3.3. Crime

The majority of tourists will not travel to a destination where they feel their safety and well-being may be threatened (Cleverdon, 2002; Namata, 2013; Pizam and Mansfield, 1996; TOCEA, 2013). A study by Lorde and Jackman (2013), on crime responses from tourists who have been victims of crimes, showed that an increase in the overall crime rate at a destination has a significantly negative impact on tourist arrivals. More so, it can take a period of 20 to 30 months before tourist numbers return to normalcy after a spike in crime rates (Lorde and Jackman, 2013). As a result, direct income losses to the local economy are significant especially as tourism businesses are highly dependent on visitor numbers to support a thriving tourism market (Lorde and Jackman, 2013).

Crime incidents such as theft occurring at tourist destinations will affect tourists and the industry negatively. A study conducted by Holcomb and Pizam (2006) found that 45% of tourists said they were unlikely to return to a tourist destination where they had experienced a theft. Crotts (1996) suggests there are certain crime hotspots where tourists are at greatest risk of theft and these are in areas with greater concentrations of foreign travellers. This suggests that an increase in tourism activity contributes to an increase in crime (Brunt, Mawby and Hambly, 2000; George, 2010). The general consensus among researchers on crime on tourists is that it is likely to affect the destination image and tourist flows negatively (George, 2010). Tourists are therefore likely to make destination decisions based on the perceived risk of

various threats such as high crime rates, and make alternative decisions if the perceived risk is too high (George, 2010; Pizam, 1999).

In **Kenya**, along with other crimes of opportunity, pickpockets and thieves often carry out snatch-and-grab attacks in crowded tourist areas (OSAC, 2015). In **Tanzania**, travellers to Zanzibar have been targeted for robbery and assault (Buchan and Calder (2010). In **Mozambique**, porous borders, endemic poverty and the country's proximity to South African markets make it vulnerable to organised criminal elements (OSAC, 2015). **South Africa's** crime, on the other hand, is more often characterised as violent and confrontational and is as big a concern for the domestic economy as it is to international tourists (SAPS, 2014).

A migrant profile revealed in the *United Nations Report on International Migrant Stocks* shows that most migrants are of working age, and in search of employment and improved living conditions in other countries (UN/DESAPD, 2015). Xenophobic attacks on these migrants can scare tourists away, a loss which reduces the socioeconomic benefits that flow to communities (Adeleke, Omitola and Olukole, 2008; Mapenzauswa, 2015). South Africa's tourism industry slumped in early 2015 following a wave of xenophobic attacks largely targeting African immigrants living in South Africa (Mapenzauswa, 2015). The recent xenophobic attacks not only have an immense negative effect on South Africa's economy but also stifle the growth of local companies in their efforts to expand into other African countries (Chen, 2015; Cronje, 2008).

3.4.4. DOMESTIC POLITICAL RISKS

Terrorist attacks, political violence and civil unrest create an adverse climate, increase the risk to tourists and have an impact on the tourism industry. Scuba diving businesses, which operate in historically tumultuous and unstable economic and political environments, are therefore highly susceptible to the effects of such tourism crises (Musa and Dimmock, 2013). Political risks are seen as the most important concerns across Africa (Booth, 2015). Confidence in Africa's economies has been a top concern and it is the perception of risk linked to political instability that can destabilise economies and cause foreign investors to hold off on investment commitments (Booth, 2015). A recent report published by Commercial Risk Africa (Booth, 2015) concluded that 91% of risk managers surveyed feel that domestic political risks are increasing, with the most pertinent being corruption and political instability (Booth, 2015). It is also evident that the institutions which are employed to govern and regulate the tourism economy (those which impose policies and regulations)

may also be impinging on tourism growth (Henderson, 2007; Seddighi, Nuttall and Theocharous, 2001). Political instability, government corruption, restrictive government regulations and strict MPA enforcement can therefore have negative repercussions for the tourism industry (Henderson, 2007). Table 3.11 shows the domestic political risks that have been identified, which will be discussed in subsequent sections.

Table 3.11: Domestic political risks

Risk Category	External Risk	Section
Domestic political risks Section 3.4.4	Political instability	3.4.4.1
	Government corruption	3.4.4.2
	Marine protected area regulations	3.4.4.3

3.4.4.1. Political instability

The tourism industry is extremely sensitive to instability (Weaver and Lawton, 2002). This is evidenced in countries where there is social unrest, change of regimes, rampant corruption and restrictive government regulations. These events reduce business confidence and affect the image of a tourist destination. Political instability is often associated with crime, violence, corruption and unsavoury business practices and is more often than not characterised by a fear of the unknown (Alesina, Özler, Roubini and Swagel, 1996).

Kenya is generally a peaceful and friendly country in terms of political activism, but it is common during elections for sporadic campaign violence to occur around the country (OSAC, 2015). Kenya’s last national election resulted in widespread unrest and violence (News24, 2017).

Tanzania has been considered to have positive nation-building policies which have created stability; however, research suggests that regional inequalities may be responsible for instability in recent years (Bandyopadhyay and Green, 2013; Green, 2011; Miguel, 2004). Some of the key issues are political tensions during Zanzibar’s national elections in 2016 due to its desire to seek independence from Tanzania; youth unemployment (17%); and inflation (WPR, 2016). Such political instability has affected Zanzibar Island’s main economic sector (tourism) which employs around half the island’s workforce (WPR, 2016).

Mozambique is a developing country that has been steadily rebuilding its economy and civic institutions since ending a 16-year civil war in 1992 (OSAC, 2015). During 2014, violent clashes between government security forces and armed RENAMO elements in the central

province of Sofala resulted in injuries and deaths. These incidents have disrupted business operations by blocking transport routes and limiting travel (OSAC, 2015).

South Africa is currently reeling from political and economic turmoil. A report by the Institute of Risk Management South Africa (IRMSA, 2015) states that South African businesses are holding off on investment decisions owing to uncertainty about the country's political future. This followed by a downgrade by Standard & Poor and Fitch after South Africa's Finance Minister, Pravin Gordhan, was ousted from his post in March 2017, and South African President, Jacob Zuma, survived another no-confidence vote in August 2017 (Fin24, 2017a; Fin24, 2017b). With a new African National Congress (ANC) president appointed in December 2017, early 2018 saw the economy and rand showing signs of strengthening (BBC Report, 2018).

Political instability therefore reduces economic growth and is particularly evident in countries where governments show negligence in governance (Alesina et al., 1996). It is a deterrent, restricts tourism growth and damages a country's image and reputation (Shaw, 2010). Some of the key triggers of political instability are civil unrest and strikes, and lack of service delivery. These are discussed in further detail in the following paragraphs.

Civil unrest and strikes. Conflict entails a disagreement between two parties, individuals or groups of individuals (Terry, 1983:83) on certain realities that leads to an event such as civil unrest. This usually comprises demonstrations, protests marches and the use of political violence (Must and Rustad, 2016; Warioba, 2008). A study conducted by Must and Rustad, (2016) concludes that a catalyst for civil unrest can be the grievances of marginalised groups, due to perceived inequalities over the sharing of resources. The results of their findings also indicate that the likelihood of supporting protests increases with a group's perceived economic inequality, perceived unfairness and increasing frustration of not obtaining resolution of their grievances (Must and Rustad, 2016). Such political unrest causes significant disruption in the tourism sector (Ingram, Tabari and Watthanakhomprathip, 2013).

Lack of service delivery. Service delivery in the context of this study refers to services provided to businesses and communities by local government. Vaux and Visman (2005:9) define 'service delivery' as:

“... the relationship between policy makers, service providers, and poor people. It encompasses services and their supporting systems that are typically regarded as a

state responsibility. These include social services (primary education and basic health services), infrastructure (water and sanitation, roads and bridges) and services that promote personal security (justice, police). Pro-poor service delivery refers to interventions that maximise the access and participation of the poor by strengthening the relationships between policy makers, providers, and service users”.

A study conducted by Chen and Chen (2016) found four major shortcomings in service delivery, namely, inadequate infrastructure; lack of government intervention; insufficient travel information at destinations; and an urgent need for sustainable development. In **South Africa**, for example, service delivery and the upkeep of key resources has been construed as unreliable (Chen, Dean, Frant and Kumar, 2014), resulting in service delivery protests. Since these services have a direct effect on the quality of life of communities, local governments are elected by citizens to represent them and are responsible for ensuring that services are delivered.

In **Kenya**, Rampa (2011) explains that political market imperfections have led to the persistent exclusion of some regions from access to services. Political market imperfections relate to diverting or misusing resources for the benefit of one group and excluding others. The result is an imbalanced distribution of services. Political incoherence in Kenya has also led to a bias in resource allocation where services are diverted or redistributed to urban areas and often to the elites (Rampa, 2011; Wild, Chambers, King and Harris, 2012).

In **Tanzania**, Warioba (2008) mentions the following service delivery issues: financial crises and insolvency due to irresponsible decision-making; inefficient tax collection; inexperienced councillors and public officials; and antagonism between public officials and local councillors. Warioba (2008) concludes that the key factors leading to problems in Tanzanian local government authorities are inadequate funding, lack of transparency and openness, lack of accountability and low levels of education.

3.4.4.2. Government corruption

Corruption is a worldwide phenomenon affecting more than 5% of the world’s GDP (OECD, 2013). Corruption may take many forms but for the purposes of this study, refers to the “illegitimate use of public or communal resources for private gain” (Neu, Everett and Rahaman, 2016:2). Government corruption has negative effects on society such as loss of governance capacity, decreased economic growth, income inequality and erosion of

competitiveness, resulting in inefficient management, a weak normative environment, a lack of transparency and controls, and an ineffective penalty system (Grossi and Pianezzi, 2016; Santana-Gallego, Rosselló-Nadal and Fourie, 2016).

Das and Dirienzo (2010) find a negative association between corruption and tourism, since bribery and fraudulent business practices damage a country's social and cultural image and impede tourism competitiveness. Balli, Balli and Rosmy (2016) find that the quality of governments is an important factor when tourists select tourism destinations. Propawe (2015) found that for every one point reduction in corruption on the Corruption Perception Index (CPI), a 2 to 7% increase in tourism results. Yap and Saha (2013) concur, citing a negative but non-linear association between corruption and tourism. However, a study by Santana-Gallego et al. (2016) found that while political risks such as terrorism and crime negatively affected tourist arrivals, corruption had no significant effect. This is not to say that tourism is not affected by corruption, but as Yan and Oum (2014) state, it is a less visible crime and often unreported due to the effort to hide dishonesty from public scrutiny.

3.4.4.3. Marine protected area (MPA) regulations

Hinch and Higham (2011) note that environmental degradation may compromise the quality of the tourist experience. One of the strategic responses to overuse of natural resources for tourism is the implementation of mechanisms to control recreational carrying capacity of sites with the aim of increasing sustainability for the natural environment, businesses and host communities.

MPAs are “declared principally to protect biological and environmental values in areas where such values are special” (Davis and Tisdell, 1995:19), and are instrumental in providing sustainable benefits for marine-based tourism (Akwilapo, 2007; Pollnac, Christie, Cinner, Dalton, Daw and Forrester, 2010; Zanre, 2005). Dive operators benefit from their relationship with MPAs (Campbell and Vainio-Mattila, 2003; Davis and Tisdell, 1995; Harriott et al., 1997). This close relationship is seen as a valuable incentive to amalgamate recreational use of coral reefs alongside conservation (Harriott et al., 1997).

Emerton and Tessema (2001) state that the main threats to MPA's in East Africa arise from human economic activities such as overfishing, destructive fishing, marine pollution, tourist developments, and the growth of marine industries. The use of coral reefs in providing various ecosystem services has also raised concerns about how effectively MPAs can protect

them due to coral reefs being highly utilised for commercial gain (mainly in marine recreational activities such as scuba diving and snorkelling and coastal tourism growth) (Bryant et al., 1998; IUCN, 2004; Thurstan et al., 2012).

A key component of MPAs is that they must serve the best interests of the stakeholders of the marine environment (Done, 2001; Masud, Aldakhil, Nassani and Azam, 2017). Dive tourism often relies on MPAs for the protection and management of coral reefs and their associated marine ecosystems which harbour an area's most pristine dive sites (Davis and Tisdell, 1995; Harriott et al., 1997; UNEP-WCMC, 2016). With most dive tourism activities taking place in MPAs, it is one of the ways to finance protected areas (Fabinyi, 2008; Francis et al., 2002). Dive operators require a permit to operate within MPAs, which restricts access, thereby contributing towards the sustainable use of the reefs (Davis and Tisdell, 1995). In places like Kenya, the Kenyan Wildlife Service (KWS) charge a conservation fee for every diver that accesses an MPA. These proceeds are passed to the KWS (KWS, 2016). In South Africa, diving permits are required before diving in MPAs. These are usually obtained at post offices or marine park offices or are arranged by the dive resorts (KZN Wildlife, 2016). MPAs in the EAME are listed in Appendix E.

However, **restrictive government regulations** in dive tourism hotspots have implications for the dive tourism industry and local communities (Davis and Tisdell, 1995; Terk and Knowlton, 2010). Davis and Tisdell (1995) maintain that scuba diving tourists have experienced regulatory constraints as a consequence of reducing the number of people allowed onto reefs or raising entrance fees to marine parks. Conversely, the establishment of MPAs can result in increased visitor numbers, leading to overuse and a reduction in the attraction value (Harriott et al., 1997; Hawkins and Roberts, 1997). Fabinyi (2008) reports that some dive operators in the Philippines feel that MPAs are created for monetary gain with little incentive to actually protect the area. Dive operators feel that governments promote a conservation agenda while using the regulation of marine environments as a means to make easy money (Mascia, Claus and Naidoo, 2010; Fabinyi, 2008). Conflicts also arise where local fishing communities are negative towards the establishment of new government managed MPAs, hindering government efforts to increase MPA coverage (Lucrezi, Milanese, Markantonatou, Cerrano, Sara, Palms, et al., 2017; Muthiga et al., 2008).

Burke et al. (2011) estimate the global coverage of MPAs on reefs to be 27%, of which only 19% of these are Indian Ocean coral reefs. Burke et al. (2011) also state that not all MPAs are effective in reducing human threats or impacts:

- Some MPAs are merely ‘paper parks’ where legislation is not enforced and their management frameworks are ineffective.
- In some cases, regulations are insufficient to address the current threats.
- MPAs are created in remote areas where few threats are present and are not in areas where urgent mitigation of local threats is needed.
- Reefs are also affected by threats that originate from far away, such as sediments from poor land-use practices; coastal development occurring outside the MPA; and marine pollution.

A study conducted by Burke et al. (2011) to assess the effectiveness of MPAs found that only 6% were effectively managed, and 13% partially managed. Emerton and Tessema (2001:1) provide a negative perspective on MPA management in East Africa:

“It is hardly surprising that MPAs may be seen by macroeconomic and sectoral planners and decision makers as having low or negligible value in Eastern Africa. Remarkably little is known about their wider economic benefits, and very little attention has been paid to maximising or capturing these benefits as tangible values. This not only makes it difficult to justify their existence; it also constrains their management. One particularly pressing management constraint is that of capturing sufficient benefits to cover the costs of MPAs and to enable them to compete on economic and financial terms with alternative, destructive, land and resource uses”.

The following provides a brief overview of some MPA issues and shortcomings in each of the EAME countries covered in this study:

Kenya. MPA legislation in Kenya is considered old and not able to cope with the current human pressures such as increasing coastal populations (Obura, 2001; United Nations, 2008), leading to marine and coastal regions being degraded even within MPAs. While fairly new legislation (Environmental Management and Coordination Act 1999) has been implemented, there are no documented cases of fines being imposed on offenders (United Nations, 2008; WWF, 2007). Furthermore, MPAs have been operated and managed by government with

minimal stakeholder engagement (Rocliffe and Udelhoven, 2010; United Nations, 2008). Management of MPAs falls under the KWS, a parastatal body of the Ministry of Tourism (Cinner, McClanahan and Wamukota, 2010). There are cases, however, where conflict persists between government and local communities. Local resource users are still concerned about being denied access to resources in marine parks and reserves (Nyawira, 2003).

Tanzania. While the legal system has institutional and legislative coverage of natural resource issues, including coastal and marine resources (UNEP/Nairobi Convention Secretariat and WIOMSA 2009; WWF, 2007), the constitution of the United Republic of Tanzania lacks explicit provisions on environmental management and protection. However, several laws and policies have been established and implemented by the two governments of the United Republic of Tanzania (Mainland Tanzania and Zanzibar), causing legislative overlap, friction and contradiction (UNEP/Nairobi Convention Secretariat and WIOMSA 2009; WWF, 2007). In Zanzibar, the Environmental Management for Sustainable Development Act 1996 provides for the protection of controlled areas known as Conservation Areas, Sanctuaries, Parks and Reserves (Ecoregion, WEAM, 2004), and follows its own variation of laws and policies to protect marine resources. Rocliffe and Udelhoven (2010:34–35) provide an account of the complexity in the management of Tanzanian MPAs:

“Responsibility for environmental management lies with the Ministry for the Environment and Human Affairs within the Vice-Presidency. The Marine Parks and Reserves Unit (MPRU) of the Department of Fisheries is responsible for managing marine protected areas, whereas the Tanzania National Parks Authority (TANAPA) is mandated with establishing national parks, including marine national parks. Ten further ministries have at least partial responsibility for marine, coastal and broader environmental issues, creating confusion, conflict and overlap”.

Mozambique. Despite a coastline of almost 3000 km in length, Mozambique has just five MPAs covering around 3% of its territorial waters (Rocliffe and Udelhoven, 2010). Protected areas are established under the Forestry and Wildlife Act 1999 (Ecoregion, WEAM, 2004; WWF 2007). In addition, although there is no MPA-specific legislation, the Marine Fishery Regulations Act (decree 16/96) permits the designation of National Marine Reserves, Nature Marine Parks and “protected marine areas” (Ecoregion, W.E.A.M., 2004). Responsibility for the overall environmental management lies with the Ministry for the Coordination of Environmental Affairs (Chircop, Francis, Van der Elst, Pacule, Guerreiro, Grilo and Carneiro,

2010). Findings by Rosendo, Brown, Joubert, Jiddawi and Mechisso (2011) indicate that there is a rift between conservation planning of MPAs and local communities where there is a lack of government enforcement to counter external fishing activities and destructive fishing practices. In addition, communities feel excluded from the benefits of tourism. Tibiriçá et al. (2011) stress the need for effective governance and management of Mozambique's marine environment to safeguard the future of dive tourism. Dive operators, who need to generate profit and provide value to dive tourists, while simultaneously protecting the marine environment, are concerned about the future of their businesses if regulators and governments do not address the issues of effective governance (Dimmock, 2007; Williams, 2013).

South Africa. Recreational fishing and scuba diving are the most common activities in the St Lucia and Maputaland Marine Reserves (Schleyer, 2000). Protected areas are established under the National Environmental Management legislation: Protected Areas Act (57 of 2003) and the Marine Living Resources Act (18 of 1998) (Department of Environmental Affairs and Tourism (DEAT) 2009; Driver, Smith and Maze, 2005; South Africa, 2014). While MPA administration and coordination is managed at the national level, its implementation and governance are largely delegated across provinces (Chircop et al., 2010; UNEP/Nairobi Convention Secretariat and WIOMSA, 2009). Ezemvelo KwaZulu-Natal Wildlife, for example, manages and enforces the World Heritage-listed iSimangaliso Wetland Park on the east coast of South Africa (Chircop et al., 2010). Until recently, the administration and coordination of national environmental policy belonged to the Department of Environmental Affairs and Tourism (DEAT) (Chircop et al., 2010), whose responsibilities were largely delegated to the management of protected areas under a separate Marine and Coastal Management Directorate (FAO, 2007). In addition, DEAT has only recently updated the National Environmental Management: Protected Areas Act of 2003 to include the term 'marine protected areas' (South Africa, 2014). Moreover, government structures introduced in 2009 have caused DEAT to be split into the Department of Tourism and the Department of Environmental Affairs (Chircop et al., 2010; South Africa, 2014). Ownership of marine resources, however, is still vested in the state. Furthermore, all MPAs are managed top-down by national or provincial government, thereby limiting the function of other stakeholders. Goble, Lewis, Hill and Phillips (2014:36) provide a perspective of coastal management in South Africa, affirming that MPAs have been "fragmented across different departments and spheres of government, all of which have different, often conflicting, mandates and management objectives".

3.5. INTERNATIONAL EXTERNAL RISKS

International risks can be defined as risks that occur outside the borders of a country (Shaw, 2010). International risks may have a direct impact on a country, but by their very nature have an indirect effect on a country's economy and on the products and services it provides. These, for example, may be related to global events such as natural disasters, terrorism, regional political instability, economic recessions and climate change (Shaw, 2010). The geographic proximity to the risks may determine the extent of the impact on the tourism industry, and by default the scuba diving industry in the EAME. For example, higher exchange rates of the US dollar and the euro may see travellers choosing to plan alternative destinations or plan domestic trips, rather than book flights and accommodation to more expensive overseas destinations (Oiro, 2015). Recent terrorist attacks in Tunisia in 2015 (Stephen, 2015) and Kenya in 2015 and 2016 (Mutambo, 2016a; Morris, 2015) have affected the African tourism industry as many people cancelled their travel plans to the region. Another example is the Ebola virus that completely overwhelmed countries in West Africa, and also had far-reaching consequences for the tourism industry in Sub-Saharan Africa (Paris, 2014). The international risks are discussed under each section of the identified risk categories (environmental, economic, social and political risks) as shown in Table 3.12.

Table 3.12: International risk categories

Indirect/International External Risk Categories	Section
Indirect environmental risks	3.5.1
International economic risks	3.5.2
International social risks	3.5.3
International political risks	3.5.4

3.5.1. INDIRECT ENVIRONMENTAL RISKS

Scientists estimate that 19% of the world's coral reefs have been lost beyond recovery and a further 20 to 40% will be lost in the next 40 years (Burke et al., 2011; Floros, 2012; Hinrichsen, 2011).

Changes to the environment around which corals thrive are influenced by the continued barrage of environmental disturbances and the ability of coral reefs to adapt to such changes (Carpenter et al., 2008). Johnson, Ambrose, Bassett, Bowen, Crummey, Isaacson, et al. (1997:582) define environmental change as "a change or disturbance of the environment

caused by human influences or natural ecological processes”. Johnson et al. (1997:581) add that environmental degradation is defined as “any change or disturbance to the environment, land or soil perceived to be deleterious or undesirable”.

The different elements of environmental change are interlinked through a complex set of physical, chemical and biological processes (UNEP/IPEC, 2003). This interlinking means that indirect events in one environment will have an impact on other environments. Such environmental changes have led to species extinctions and reductions in biodiversity (Hall and Lew, 2009). Dive tourism is considered a high intensity tourist activity (due to its high carbon impact) making it the one of the most energy-intensive forms of marine recreational tourism with the exception of cruise ships (Klein, 2002). The main threats to coral reefs not only include direct impacts (tourism-related activities, land-based pollution, overfishing, coastal development, as discussed in Section 3.4.1), but also indirect impacts (climate change, marine pollution, industrialisation of coastal regions, and increased shipping and boating) (Burke et al., 2011; Floros, 2012; Harvey, 2000). Table 3.13 lists these individual external risks and indicates in which section they will be discussed.

Table 3.13: Indirect environmental risks

Risk Category	External Risk	Section
Indirect environmental risks Section 3.5.1	Climate change and coral reefs	3.5.1.1
	Industrialisation of coastal regions	3.5.1.2
	Increased shipping and boating	3.5.1.3
	Marine pollution	3.5.1.4

3.5.1.1. Climate change and coral reefs

Climate change has far-reaching implications for the health and functioning of coral reef ecosystems (AIMS, 2016; Anthony and Marshall, 2009; Hughes, Baird, Bellwood, Card, Connolly, Folke, et al., 2003; Roe, Adcock and Riga, 2016). The worldwide impacts of global warming⁴ are expected to increase over the coming decades. The effects of global warming are exacerbated by regional and local impacts, such as deteriorating water quality from pollution, destructive diving, increased recreational activities and fishing practices (Anthony and Marshall, 2009; Sale, Agardy, Ainsworth, Feist, Bell, Christie, et al., 2014). When combined, these factors act together to significantly degrade the resilience of coral

⁴ Global warming is the result of increased CO₂ in the atmosphere from the burning of fossil fuels and is a key determinant of climate change (Carpenter et al., 2008; IPCC, 2013).

reefs to the point where they are unable to recover from even minor disturbances (Anthony and Marshall, 2009; Becken and Hay, 2007; Obura, 2017; Sale et al., 2014; WMO, 2010). According to the World Meteorological Organisation (WMO), “such interactions or potential feedbacks between global CO₂ effects and local or regional disturbances affecting reef resources heighten the urgency of abating carbon emissions” (WMO, 2010:10).

Scott, Amelung, Becken, Ceron, Dubios, Gössling, et al. (2008:180) state that “the evidence is clear that the time is now for the tourism community to collectively formulate a strategy to address what must be considered the greatest challenge to the sustainability of tourism in the 21st century, climate change”. Climate change is defined by the Intergovernmental Panel on Climate Change (IPCC) as any change in climate over time, whether due to natural variability or as a result of human activity (IPCC, 2007a; 2013).

Burke et al. (2011) suggests that the state of coral in the Indian Ocean has shown significant decline as a result of anthropogenic and climate-related episodes, where as much as 68% of coral reefs are under threat. Research has indicated that climate change in ocean temperatures could effectively kill off most hard coral species by mid-century, with unknown consequences for remaining coral communities (Wilkinson, 2008). Climate change-related episodes include coral bleaching related to sea surface temperature rise, sea-level rise, ocean acidification and extreme weather events (Aronson and Precht, 2006; BBC Report, 2016c; Buddemeier et al. 2004; Buddemeier, Jokiel, Zimmerman, Lane, Carey, Bohling, et al., 2008; Aronson, 2010; Jury, Heron, Spillman, Anthony, Dexter and Sivakumar, 2010; Mimura, Nurse, McLean, Agard, Briguglio, Lefale, et al., 2007; Wilkinson and Souter, 2008). These are discussed below.

Coral bleaching and sea surface temperature (SST) rise. Scientists observe one of the most destructive forces on coral reefs in the WIO to be coral bleaching. Research suggests that rising sea surface temperatures are the primary cause of mass coral bleaching events (Australia, 2016; Celliers and Schleyer, 2002; Cesar et al., 2003; Hoegh-Guldberg, 1999; Obura, 2005b; Obura, 2017; Wilkinson and Souter, 2008). The high water temperatures associated with the 1998 El Niño Southern Oscillation (ENSO) caused a widespread bleaching event that resulted in 50% mortality of reefs in some areas of the EAME, with other events in 2004 and 2005 also contributing to coral reef degradation (McClanahan, 2004; Obura, 2005a). Increases in thermal anomalies in sea temperatures have coincided with more

recent coral bleaching episodes, such as the recent 2015/2016 ENSO (AIMS, 2016; Hoegh-Guldberg, 1999; NOAA, 2016; Obura, 2017).

Coral bleaching results from the loss of symbiotic algae (zooxanthellae) from coral tissues during times of stress, leading to high mortality of corals and their reef ecosystems (Glynn, 1993; Spalding, 2004; Obura, 2005b). If SST occurs over a prolonged period, such as several weeks or months, an elevation of 1 °C to 2 °C can trigger a bleaching event (Spalding, 2004; Hoegh-Guldberg, 1999; West, 2001; West and Salm, 2003). 2015 and 2016 has seen oceans record their highest monthly temperatures, making this one of the strongest El Niño events ever recorded (NOAA, 2016). Much of the record warmth for the globe in 2015 and 2016 was attributed to record warmth in the global oceans (NOAA, 2016).

Sealey-Baker (2010) states that mass bleaching events are thought to have only occurred every decade or century prior to the 1980s, but from 1982 to the present, coral bleaching events around the world have increased in frequency and are expected to increase to near-annual frequency in the next 20 to 50 years. Obura (2005b) confirms this at a regional level (East Africa and Western Indian Ocean) with his findings that rising sea surface temperatures that were catastrophic in 1998 are predicted to be repeated once every five years by approximately 2020. This is predicted to occur at lower latitudes in the Indian Ocean between 10° and 15° latitude, and further south at higher latitudes. The future of coral reefs is highly uncertain as it is unclear what the overall effects of coral mortality will be, and whether coral reefs will have the adaptive capacity to deal with the rapid change in SST rise. However, if the effects that the 2015/2016 El Niño had on Australia's Great Barrier Reef are any indication, where an average of 67% of coral died as a result of rising SST, they will be devastating to the world's largest continuous living organism (Coral Reef Studies, 2016).

The effects of climate change on coral reefs and their associated ecosystems is also a threat to the coastal communities that derive benefits from the coral reefs themselves (Burke et al., 2011; Davis and Tisdell, 1995; Gössling et al., 2008). The scuba diving industry will also be affected by coral mortality, as divers are less inclined to visit dive sites in areas where the once pristine marine environment has been degraded.

Sea-level rise (SLR). Scientists have observed the immediate effects of sea level rise (SLR) to be the submergence and increased flooding of coastal land; erosion of beaches and near-shore developments; as well as saltwater intrusion of surface waters (Ibe and Awosika, 1991;

IPCC, 2007a; Nicholls and Cazaneve, 2010). Long-term effects would include increased erosion of coastal zones; reduced ability of coral reef algae to adapt to lower levels of light; the reduction of coastal wetlands, saltmarshes and mangroves; and changes in coastal development and infrastructure (Burke et al., 2011; Richmond, 2011). The Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC) projects that global sea levels will rise by between 60 centimetres to one metre by 2100 as a result of rapid ocean warming and the melting of glaciers (IPCC, 2007b). Migration away from coastal areas is expected to occur as land is reclaimed by the sea and water resources and low-lying areas become scarcer (Nicholls and Cazaneve, 2010). These physical impacts have both direct and indirect socioeconomic effects.

Research by Bigano, Bosello, Roson and Tol (2008) suggests that the biggest impact of SLR on economies will be the shift in tourism in coastal areas, disrupting the demand for recreational activities through land loss and market services. The economic impact is expected to be felt more in developing countries whose economies are more reliant on tourism, such as Africa and Southeast Asia, both of which lie in the Indian Ocean (UN HABITAT, 2008).

According to Kebede, Nicholls, Hanson and Mokrech (2012), climate-induced SLR and storm surges are set to increase the exposure of many low-lying coastal cities in Africa. Based on climate change scenarios proposed by Kebede et al. (2012), population growth estimates and asset growth in the region will likely be affected by a sea-level rise of 43 centimetres by the year 2080, thus affecting 60% of the population in the area.

Estimates that coral grows at a range of between 1 to 10 millimetres per year suggest that reef growth rates may be able to sustain a rise in sea levels (Brown, 1997). According to Wilkinson and Souter (2008), coral growth is currently at 3.4 millimetres per year. Other sources, however, expect SLR to have a negative effect on coral reefs. The Intergovernmental Panel for Climate Change (IPCC, 2001), for example, predicts that this growth rate may not be enough to counter SLR, given that the degree of ocean currents and storm surges may affect coral reef ecosystems differently in other areas. In addition, growth rates may decline due to lack of light penetrating the water's surface, and the coral's ability to adapt quickly enough to SLR, given additional stressors present such as coral bleaching and coral disease (Kleypas, McManus and Menez, 1999). Brown, Kebede and Nicholls's (2011) findings suggest that countries most vulnerable to climate induced SLR are coastal zones with dense populations (Southeast Asia and East Africa), low elevations (Mozambique and Egypt),

inadequate adaptive capacity (Caribbean), and increasing rates of subsidence along coastal areas (Maldives, Tuvalu).

Ocean acidification. Coral reefs are also experiencing mortality as a result of ocean acidification (Jury et al., 2010). The increase in anthropogenic CO₂ since the beginning of the industrial revolution has led to the ocean becoming more acidic. This is termed ‘ocean acidification’ and has emerged as a great concern for the health of global marine ecosystems over the past few decades. Ocean acidification occurs as a result of excess carbon dioxide (CO₂) dissolving in seawater, thereby reducing the water’s PH level, in effect making it more acidic (Baker, Glynn and Bernhard, 2008; Wilkinson and Souter, 2008). The process of calcification forms the base of the entire reef structure; however, higher CO₂ concentrations in the seawater will reduce a coral’s ability to grow, and ultimately affect its structural strength (Grimsditch and Salm, 2006). Reduced calcification in reefs decreases habitat quality and diversity, and the reefs' ability to absorb wave energy, which is instrumental for coastal protection (Hoegh-Guldberg, Mumby, Hoostem, Steneck, Greenfield, Gomez, et al., 2007). Reduced effectiveness of coral reefs can prove detrimental to coastal populations, as fish species may decline and the reefs they depend on for protection and food could be substantially diminished. This can have implications for the tourism industry, as businesses depend on dive tourists being able to experience healthy reefs. Increasing atmospheric CO₂ concentrations are expected to continue to acidify the oceans, and are likely to pose a great danger to the recovery and survival of coral reefs globally, along with other marine shell-forming organisms (Richmond, 2011).

Extreme weather events. Rising global average temperature is associated with widespread changes in weather patterns. Scientific studies indicate that extreme weather events such as heat waves and large storms are likely to become more frequent or more intense with human-induced climate change (Burke et al., 2011; Fischer and Knutti, 2015). A recent study by Fischer and Knutti (2015) suggests that the effects of warming will vary around the world. Weather events at the equator will become more extreme with 2 °C of warming, meaning tropical countries already dealing with frail infrastructure and poverty will experience more than 50 times as many extremely hot days and 2.5 times as many rainy ones.

Tropical storms are also predicted to change in strength and frequency, as a result of rising sea surface temperatures (Knuston, Sirutis, Garner, Veechi and Held, 2008). While the coral reefs are weakened by other climate change factors, like coral bleaching and ocean

acidification, coastlines will be susceptible to increased tropical storm waves and flooding. When reef structures are constantly being weakened structurally by these types of stressor, they may no longer be able to resist the effects of increasingly intense and more frequent storms (Wilkinson and Souter, 2008). Strong winds associated with storms also cause the erosion of dunes and the consequent siltation destroys corals (Hoguane and Pereira, 2003). Damaged corals will not be able to recover in time as the increased frequency of storms will continue to erode the coral reef structure, ultimately reducing reef resilience and severely affecting the surrounding marine ecosystems (Perkins, Alexander, and Nairn, 2012; Rahmstorf, and Coumou, 2011; Wilkinson and Souter, 2008).

3.5.1.2. Industrialisation of coastal regions

Africa's marine and coastal resources have traditionally supported livelihoods through artisanal fisheries and subsistence agriculture. At present, the EAME is experiencing rapid urban and industrial growth, with the development of harbours and ports, urbanisation, industrial fisheries, oil and gas exploration and tourism (Arthurton and Korateng, 2006). Much of the region's natural coastal assets have supported a growth in tourism, bringing substantial economic benefits. Countries are looking to expand their coastal tourism, thus extending to eco-tourism and cultural tourism to provide opportunities for local communities. With artisanal fisheries acting as important elements that contribute to the livelihoods of East Africans, the benefits they derive vary as most fisheries are foreign flagged vessels bound for Asian and European markets. Expansion of harbours and construction of new ports are seeing an upsurge along the EAME coastline, providing new trade routes to Asia such as the construction of the new Bagomoyo port in northern Tanzania (Feaffa.com, 2016), which is competing with the expansion of the Port of Mombasa (Mutambo, 2016b) and the newly proposed port in Lamu in the north of Kenya (Edgar, 2015).

These infrastructure developments are occurring in line with these two countries' railway developments, which will connect land-locked countries such as Uganda, Rwanda, Burundi, South Sudan and Ethiopia to trade opportunities with the rest of the world (BBC Report, 2016a). South Africa also has a proposed project, Phakisa (Operation Phakisa, 2014), which will expand its coastal EEZ for growth in mineral, gas and oil exploration and expansion of its fisheries industry.

The main concerns of this rapid urbanisation of coastal regions in the EAME are the potential loss of biodiversity, habitat degradation, and the modification of mangrove and coral reef

ecosystems to make provision for this industrial growth. Infrastructure developments along the coastal areas of the EAME such as those mentioned above, will no doubt contribute to coastal degradation of key marine ecosystems (such as coral reefs) through increased human-related pressures (Arthurton and Korateng, 2006; Richmond, 2011; Burke et al., 2011; Pereira, Litulo, Leal, Fernandes, Santos, Tibiriçá, Williams, et al., 2014).

3.5.1.3. Increased shipping and boating

Increased shipping and boating traffic results in coral reef damage around the world (BBC Report, 2016a; Golgowski, 2015; Howard, 2016; Rappler.com, 2016; Scarlet and Bandeira, 2014), and is occurring in the EAME region at increasing rates (Burke et al., 2011; Cesar et al., 2003). Boat and ships anchors cause considerable damage when dragged along reefs, often going unchecked, with few or no penalties imposed (Burke et al., 2011). Vessel groundings have a catastrophic effect on coral reef ecosystems as they can devastate very large areas of coral reefs by completely dislodging reef frameworks (Burke et al., 2011). In addition, dredging activities near coral reefs increase their likelihood of coral disease (Jones, Bessell-Browne, Fisher, Klonowski and Slivkoff, 2016). With an expected future increase in economic activity and infrastructure development of coastal regions, an expansion in shipping traffic along the EAME coast is likely to impact further on coral reefs (Oskin, 2014).

Some of the issues regarding shipping and port activities highlighted by Scarlet and Bandeira (2014) include exhaust fumes discharged to the atmosphere; oily bilge water and oil sludge from engine rooms discharged into the sea; toilet sewage discharged into the sea; garbage and galley waste discharged into the sea; dredging; ship ballast; antifouling (paint containing chemicals to impede the growth of barnacles, algae and marine organisms on ships' hulls); and accidental oil spills from damaged tankers such as the Katina P accident, which spilled 72 000 tons of heavy fuel oil into Maputo Bay, Mozambique, in April 1992. Additionally, high volumes of crude oil being shipped through the Mozambique Channel sometimes result in accidental oil spills that impact on marine ecosystems along the coastline (Pereira et al., 2014).

3.5.1.4. Marine pollution: land-based pollutants, micro-plastics and floating marine debris

Sources of pollution are difficult to establish given that contaminants often travel a distance before they settle on or near a coral reef environment where they are likely to do harm.

Indirect environmental effects resulting from marine pollution have various sources, some of which are land-based and others which originate from the deep ocean. Research also indicates that marine pollution from increased recreational activity is exacerbating coral reef degradation as additional sediments and chemicals are added to areas around coral reefs such as grey water, engine oil and the chemicals found on boat hulls (Danovaro, Bongiorni, Corinaldesi, Giovannelli, Damiani, Astolfi, et al., 2008). Even contaminants found in sunscreen can cause coral disease, ultimately resulting in coral bleaching (Danovaro et al., 2008). Sources of marine pollution can stem from:

Industrial waste. Organic and inorganic pollutants flow into rivers or straight out to sea and are loaded with heavy metals and persistent organic compounds which are ingested by marine animals (Scarlet and Bandeira, 2014).

Shipping and port activities. Discharge of oil, sewage, garbage and dirty bilge water from ships as they pass nearby coral reefs on their way into ports and harbours (Pereira et al., 2014).

Agriculture. A significant source of marine pollution in coastal waters stems from agricultural contaminants flushed into rivers which enter the oceans. These are caught by ocean currents and settle on coral reefs (Richmond, 2011).

Marine debris. Marine debris can accumulate in oceanic gyres which are circulated in smaller clusters and carried by ocean currents. Storms can push much of the marine debris towards land, polluting the beaches and shallow coastal marine areas such as coral reefs. Recent studies conducted at various locations around coastal urban centres in southern Mozambique revealed that plastics, cans and glass were most profuse as a result of land-based pollution that made its way into the sea (Fernandes, Chemane and Louro, 2012) while litter on remote beaches (fishing nets, plastic bottles, disused floats, etc.) originated from shipping activities (Pereira et al., 2014).

Plastics. Micro plastics (articles up to 5 mm in diameter, either manufactured or created when plastic breaks down) have become one of the most catastrophic forms of marine pollution destroying marine ecosystems (Baztan, Carrasco, Chouinard, Cleaud, Gabaldon, Huck, et al., 2014; Baztan, Jorgensen, Pahl, Thompson and Vanderlinden, 2016). Oceanic currents carry tons of plastic (predominantly thrown overboard from ships) where they congregate in oceanic gyres and degrade into very small pieces which are consumed by fish,

birds and mammals, often resulting in death. These are also known to accumulate around coral reefs. Marine plastic pollution causes US\$13 billion worth of damage to marine ecosystems each year, according to the United Nations Environment Program (UNEP, 2014). Plastic pollution for example, has become such a major problem in Tanzania that the government has imposed a total ban on plastic bags in the country (AllAfrica, 2016).

3.5.2. INTERNATIONAL ECONOMIC RISKS

The international tourism industry can be defined as “the sum of domestic activities that directly support the consumption of goods and services of foreign tourists in that country” (UN, 1999:211). International tourism may promote economic development in developing countries. A study by Modeste (1995:444) concluded that “economic development is positively affected by growth in the tourism sector”. Skerritt and Huybers’ (2005) analysis on international tourism in developing economies found that it contributed positively to development in African countries. This is because tourism in developing countries expresses higher productivity (driven by the competitive nature which induces innovation, adaptability, and more efficient management of tourism operators’ resources) than other sectors in the economy. This efficient supply is due to tourist demands for high levels of technology, skilled labour and internationally competitive management. Skerritt and Huybers (2005:25) concur, stating that international tourism is “more susceptible to external competition with pressures for productivity improvements being present, ultimately leading to more investment, higher profits, and more rapid economic growth”.

However, the effect of international tourism on economic growth and development may depend on the ability of the host country to cope with rapid change and a flood of foreign capital and investment, while simultaneously containing the harmful effects (such as environmental degradation, cultural deterioration, and the dislocation of traditional communities) (Skerritt and Huybers, 2005). Coupled with this is the high dependency on the stability of world economies, as emerging market economies are heavily reliant on international tourism (Lejarraja and Walkenhorst, 2007). The international economic risks identified are economic recessions, price competitiveness and dive tourist accessibility, as shown in Table 3.14. These are discussed below.

Table 3.14: International economic risks

Risk Category	External Risk	Section
International economic risks Section 3.5.2	Economic recessions	3.5.2.1
	Price competitiveness	3.5.2.2
	Dive tourist accessibility	3.5.2.3

3.5.2.1. Economic recessions

An economic recession occurs in a country or region of the world when there is a decline in economic growth or GDP for at least two consecutive quarters, as well as a fall in employment, industrial and manufacturing output, slump in retail sales and drop in per capita income. In essence, an economic recession is characterised by a declining demand for raw materials, products and services (Srinivasan, Lillen and Rangaswany, 2002).

Economic shocks have characterised the first decade of the new century. Eugenio-Martin and Campos-Soria (2013) affirm that according to economic theory, during periods of instability and uncertainty in the economy, expectations of consumer behaviour change, specifically impacting on disposable income. An economic crisis is likely to result in a decrease in disposable income which is directly related to a decrease in a household's consumption (Eugenio-Martin and Campos-Soria, 2013). Thus, luxury goods and services, such as travel and tourism expenditure, are expected to be more sensitive during economic crises (Eugenio-Martin and Campos-Soria, 2013). This was evidenced following the 2008 world financial crisis, which saw global tourism arrivals decrease by 3.8% (UNWTO, 2011).

Financial crises. The 2008 global financial crisis triggered an economic slowdown worldwide. This was accentuated by rising food prices and inflation, impacting on consumers as the world economies struggled to get a foothold towards recovery (Pento, 2016; UNWTO, 2011). With the key source markets outside Africa coming from Asia (predominantly China), North America and Europe, a slowdown in these countries GDPs resulted in changes in travel habits, which negatively affected tourist arrivals in 2009 (Candela and Figini, 2012; UNWTO, 2011).

3.5.2.2. Price competitiveness

For businesses to maintain a profit margin and to survive in a competitive business climate, it is important to maintain control of their operational costs. While the business environment is not constant and is faced with changing circumstances, the competitiveness of a business and

the industry in which it operates serves as a key determinant to its success. Dwyer, Forsyth and Rao (2001) state that, “competitiveness is a general concept that encompasses price differentials coupled with exchange rate movements, productivity levels of various components of the tourist industry and qualitative factors affecting the attractiveness or otherwise of a destination”. With the development of the travel industry making travel accessible to more locations around the world, new markets and business environments have opened up, creating new opportunities. This has led to increased competition resulting in increased demand and complexity in tourism markets, requiring more flexible and comprehensive approaches to tourism planning (Pearce, 1997).

Shaw (2010:151) cites Dwyer et al. (2001), who found that the competitiveness of an industry was found to be a “critical determinant of how well it operates in world markets”. The findings highlight that the “ability of a country’s tourism industry to grow and prosper depends largely on the tourism industry’s ability to deliver goods and services to the tourists that visit the country, and in so doing, maintain a sustainable competitive advantage” (Shaw, 2010:151). Forsyth and Dwyer (2009:78–79) and Shaw (2010) provide evidence that, in their choice of destination, tourists undertake extensive price comparison, as well as comparing the price with the cost of living at their place of origin.

Pricing of products and their offerings can influence tourism demand and is a strategic business decision, taking in all marginal costs and offsetting them against potential revenues. George (2008:272) states that good pricing can position a business well in the market by promoting a product at a price level that is low enough to offer great value to the tourist, yet high enough to enable the organisation to reach its financial objectives. One of the strategies when businesses wish to penetrate new markets is market penetration pricing (George, 2008). This may involve introducing below-market prices to attract customers or to undercut competitor prices. A study by Pearce (1997) on the competitiveness of Sabah as a dive tourism destination in Borneo, Malaysia, found that while the area faced strong competition, strategies implemented (such as reasonable pricing) created a sustainable competitive advantage.

Exchange rates. Exchange rates are an important factor influencing tourism competitiveness. Other things being equal, if a country’s exchange rate rises, its tourism competitiveness falls (Forsyth and Dwyer, 2009). A decline in exchange rates can offer advantages and disadvantages to the local tourism industry, while changes in exchange rates can affect a

tourist's choice of a travel destination (Oxley and Buecking, 2015). For example, fewer South Africans choose to travel overseas because the weak rand makes the purchase of foreign currency expensive. Even strong economies can be affected by exchange rate fluctuations, as was evidenced by the drop in tourist demand by UK travellers to other countries post the Brexit vote (Sandle, 2016). Weakened currencies have a tendency for people to travel domestically, which is a more affordable option, but can lead to the over-pricing of local goods and services over time. Table 3.15 shows the exchange rates of Kenya, Tanzania, Mozambique and South Africa from 2008 to 2016. Years presented in the table are not sequential in order to provide a view of the exchange rate trend over time.

Table 3.15: Exchange rates for EAME countries (2008–2016) (expressed in local currencies*)

	2016	2015	2012	2011	2010	2009	2008
Kenya (KES)	102.1	98.2	84.5	88.8	79.2	77.4	69.2
Tanzania (TZS)	2177	1991	1583	1572.1	1409	1320	1196
Mozambique (MZN)	63	40	28.4	29.1	34	27.5	24.3
South Africa (ZAR)	14.7	12.8	8.2	7.3	7.3	8.5	8.3

Source: KNOEMA (2017e). Values calculated as an annual average based on monthly averages *(local currency units relative to one US dollar).

Regarding the advantages of declining exchange rates, tourism has emerged as one of the EAME's fastest growing sectors and a major contributor to GDP, because it is seen as a relatively cheap destination for international visitors (Mapenzauswa, 2015). The decline in EAME currencies against the euro, the British pound and the US dollar has resulted in the growth in international tourism. Weakened currencies are partly a result of international economic factors, as well as domestic factors such as labour unrest, political instability and a grim economic outlook (Davies, 2013).

3.5.2.3. Dive tourist accessibility

Accessible tourism can be defined as the ongoing endeavour to ensure tourist destinations, products and services are accessible to all people, regardless of their physical limitations, disabilities or age (Darcy and Dickson, 2009:34). According to the European Network for Accessible Tourism (ENAT, 2016), accessible tourism includes:

- Barrier-free destinations: infrastructure and facilities
- Transport: by air, land and sea, suitable for all users
- High quality services: delivered by trained staff

- Activities, exhibits, attractions: allowing participation in tourism by everyone
- Marketing, booking systems, websites and services: information accessible to all.

According to Gauci, Gerosa and Mwalwanda (2002), access to a destination is considered a vital factor for tourism development in Africa. Tourists perceive challenges to gaining access to tourist sites in remote areas (particularly in developing countries) as major obstacles to travelling (Griffin and Edwards, 2012). Dive sites are generally located in remote wilderness areas which are considered to be pristine environments and more difficult to reach. Access to such areas along the EAME coast is more costly and time-consuming, often beset by challenges such as obtaining access to transport and attractions, poor road infrastructure, visa issues, access to foreign currency and inadequate facilities (Griffin and Edwards, 2012; Wade and Eagles, 2003).

Pearce and Schänzel (2013) state that destination management is the consistent orientation of tourist services and service providers to the needs of potential tourists. Their findings highlight destination infrastructure and access as areas requiring consideration. Tourists perceive the quality of a destination not just by destination image, but also by management – comparing good versus poor destinations. Fuchs and Weiermair (2004:212) state that “the fundamental goal of destination management is to assess the adequacy and effectiveness of the product, facilities, services and programs that altogether provide memorable tourism experiences for visitors”. Access to attractions (dive tourist sites) is imperative and requires engagement from all stakeholders in the tourism value chain. While many aspects may be out of the dive operator’s control (Griffin and Edwards, 2012), greater attention should be paid to improving access to tourism destinations (Wade and Eagles, 2003).

3.5.3. INTERNATIONAL SOCIAL RISKS

Global disease epidemics, such as the Ebola and Zika virus epidemics, have negatively influenced travel to tourism destinations in recent years. Similarly, there has been an increase in cross-border criminal activities, such as terrorism, money laundering, corruption, fraud, illegal wildlife trafficking and theft. The population densities in neighbouring countries are also on the rise. Increasing social issues are thus considered to have a negative effect on coastal and marine tourism. Global disease epidemics, international crime and coastal migration will be discussed in this section as shown in Table 3.16.

Table 3.16: International social risks

Risk Category	External Risk	Section
International social risks Section 3.5.3	Global disease epidemics	3.5.3.1
	International crime	3.5.3.2
	Coastal migration	3.5.3.3

3.5.3.1. Global disease epidemics

Global disease epidemics result in decreased demand for travel to affected regions, which impacts on local economies (Kitua et al., 2011; IMF, 2014; WHO, 2014a; World Bank, 2014; WHO, 2016a). Such epidemics prompt international agencies to impose strict quarantine protocols on the affected countries in order to contain the epidemics (WHO, 2014b). The Ebola virus in West Africa had a significant effect on tourism to Africa in 2014 and 2015 (WEF, 2015). More recently, the Zika virus crossed the Atlantic Ocean and visitor numbers dropped as a result (Johnson, 2016). Cholera outbreaks can affect large areas, affecting communities in and visitor numbers to African countries (WHO, 2016b; WEF, 2015). Each of these are discussed in further detail below.

Ebola. With the outbreak of the Ebola virus epidemic, which swept through West Africa in 2014, a worldwide fear-induced decrease in travel to the EAME region was observed. While most travellers are aware of the distances between West Africa and other Sub-Saharan countries, travellers to the region exercised caution and delayed bookings to other regions of Africa (Paris, 2014). With the number of cases exponentially increasing in affected areas at the time, several agencies and governments called for massive coordinated interventions aimed at the surveillance and containment of this epidemic (Poletto, Gomes, Pastore y Piontti, Rossi, Bioglio, Chao, et al., 2014).

Cholera. Every year, cholera affects several hundred thousand people globally, with a case fatality rate of over 2% (WHO, 2016b). Africa reported the most cases during the 2013 cholera outbreak (Rebaudet, Sudre, Faucher and Piarroux, 2013). Cholera epidemics have spread to coastal areas and to different environments including crowded slums and refugee camps, with human displacement a major determinant of cholera outbreaks (Colwell, 1996; Rebaudet et al., 2013). Nearly three-quarters of the 1.5 million cholera cases reported in Africa during the past ten years were located in countries with access to the sea (UNHCR, 2015; WHO, 2016b). Cholera thrives in coastal seawaters, mangrove forests and estuaries if

saline levels show increased levels in sea surface temperature (SST) and increased levels of organic nutrients (Colwell, 1996; Lipp, Huq and Colwell, 2002; Pruzzo, Vezzulli and Colwell, 2008; Vezzulli, Pruzzo, Huq and Colwell, 2010).

Cholera outbreaks have, for example, also affected islands such as Pemba, Zanzibar and the Comoros (Jutla, Akanda, Griffiths, Colwell and Islam, 2011), with the assertion that a positive relationship exists between SST and phytoplankton abundance in coastal waters, leading to cholera outbreaks. In the EAME, cholera is most prevalent in port cities and fishing areas (Rebaudet et al., 2013). With infrastructure being poorly developed to handle such crises, cholera outbreaks would have an impact on tourism in the EAME (Maponya, 2008; Tairo, 2015).

Zika virus. The Zika virus has been linked to neurological disorders including babies being born with small brains. By the end of 2016, the spread of the Zika virus was expected to infect nearly four million people, according to the World Health Organization (Johnson, 2016). While the Zika virus has been constrained to South and Central America, it has now crossed the Atlantic Ocean and is on Africa's doorstep (Johnson, 2016). Fortunately, the virus has been contained. The National Centre for Atmospheric Research (NCAR) has found that factors like weather, travel and poverty could increase the spread of the Zika outbreak (Johnson, 2016). As with Ebola and Severe Acute Respiratory Syndrome (SARS), the Zika virus could cause countries to impose travel restrictions to regions within Africa. The spread of such pandemics negatively affects the tourism industry.

3.5.3.2. International crime

The rise of organised crime is an accepted fact of the global economy. With the onset of globalisation and the internationalisation of markets, uncertain political and economic environments, and new technological advances in virtual currencies and e-commerce businesses, criminals are exploiting these new trends and operating at the cutting edge of technological advancements to gather illegally generated income. These criminals have adapted and flourished in the new global economy, and governments and regulators have struggled to thwart their illegal activities. International crime consists of a number of activities such as the trade in drugs and ivory, sales of arms, prostitution, terrorism, corruption, fraud, theft, human trafficking, blackmail and extortion (Lilley, 2003). Money laundering, terrorism and piracy are discussed in further detail because these external risks have had a high degree of publicity in the region over the past few years.

Money laundering. A report published by Honest Accounts (2017) states that Africa lost US\$103 billion in illicit financial outflows and other illegal activities in 2015, indicating that more money is leaving the continent than entering it. Money leaves mainly by foreign companies repatriating profits, tax avoidance schemes and by illegally moving money out of the continent (Brown, 2017). Owing to the largely cash-based and often informal economies of Africa, criminals are able to move money across borders in the form of oil or precious stones. A common problem in some African states is that enforcement of legislation is lacklustre or non-existent.

Terrorism. Terrorism represents a threat to law and order and undermines stability and security in political, economic and social arenas. Tourism businesses and tourists are often deliberately targeted by terrorists. The reasons for this may be to generate worldwide publicity; to kidnap and demand ransom for international tourists; because tourists tend to gather and are easily recognisable; or because beaches, hotels and resorts are seen as soft targets (Dimanche, 2004; Henderson, 2007; Horner and Swarbrooke, 2004; Richter and Waugh, 1986). The consequences of terrorism tend to last, as reduced visitor arrivals harm local tourism industries and the economy.

Stafford, Chandola and Marmot (2007) and Baker (2014), who cites Seddighi et al. (2001), state that the effects of terrorist attacks will inevitably lead to the “decline or disappearance of tourist arrivals in some tourist destinations”. While various other risks to tourists may affect the flow of tourists to a destination, the threat of terrorism tends to affect tourism more severely (Baker, 2014). East Africa is one of the most conflicted and poorly governed corners of the world. Terrorists based in Somalia pose a security threat to the region, while piracy off the Somali coast affects regional economic interests. The challenge of tackling poor governance has been at the forefront of East African countries in dealing with ongoing efforts to bring stability to the region (Bryden, 2014; CSIS, 2016). In 2014, al-Shabaab carried out one of the deadliest attacks in Kenya’s history, killing 48 people. The terrorists were targeting hotels, resorts and business near the coastal town of Lamu, which is situated close to the Somalian border (Pflanz, 2014). Terrorism remains a high priority concern in Kenya and its neighbouring states. Terrorist acts have included suicide operations, bombing and grenade attacks, kidnappings, attacks on civil aviation, and attacks on maritime vessels in or near Kenyan ports (CSIS, 2016; OSAC, 2014; 2015). On 14 October 2017, two explosions killed

over 300 people in Mogadishu, making it the worst terrorist attack in Somalia's history (Russia Today, 2017).

Piracy. In recent years, Somali pirates have seized dozens of vessels and made millions of dollars from ransoming the crews of stolen ships. Operating from 'mother ships', as well as remote ports along the Somali coast, they have terrorised shipping in the Gulf of Aden and around the Horn of Africa, roaming far out into the Indian Ocean (Squires, 2011). The economic impact has been devastating for Kenya's marine tourism industry. The number of tourists visiting by cruise ship as far south as Mombasa had dropped by 95% by 2010, and has affected the safari and wildlife tourism industry as well (Tairo, 2011; World Bank, 2013b). There has also been a significant increase in maritime piracy and terrorism attacks on shipping in the EAME. While attacks are usually concentrated off the Somali coast, they have occasionally occurred off the coasts of Seychelles, Kenya, Tanzania, Mozambique and Madagascar (Mbekeani and Ncube, 2011). This increase is a major threat to East African peace and security and has a negative impact on tourism growth (Mbekeani and Ncube, 2011). Piracy attacks may discourage high income tourists from visiting East Africa, and service providers may also have to lower their prices to stimulate demand to attract tourists.

3.5.3.3. Coastal migration

The coastal environment along the southern and east African shores represents a critical interface of human activity, socioeconomic influence and ecological diversity (Goble et al., 2014). Growing coastal populations are threatening the health of the marine environment, with coastal development and growing migration of people, often bringing social problems such as crime and disease (Baker, 2014; Corcoran et al., 2010; Tairo, 2015). Throughout the Indian Ocean the relationship between human population growth and ecosystem degradation is one of overexploitation of natural resources (Sections 3.4.1.1 and 3.5.1.2). As human populations in coastal areas increase and techniques to harvest dwindling natural resources become more efficient, the pressure on coral reefs and associated ecosystems to provide food for dependent populations is escalating well beyond sustainable limits. This is resulting in the universal overexploitation of fish stocks and the widespread use of more effective and destructive fishing techniques (Souter and Linden, 2005; Richmond, 2011).

The coastal and marine zones over most of the planet are becoming more populated with a population density of several thousand per square kilometre in coastal zones, as described in Section 3.4.3.2. As a consequence, during the past few decades the coastal zone has become

urbanised in many countries surrounding the Indian Ocean (Souter and Linden, 2005). In addition, the expansion of urban and industrial centres to accommodate the influx of people to coastal areas has resulted in unregulated or poorly planned developments that have been established at the expense of productive coastal ecosystems, degrading these through the discharge of untreated effluents and the accumulation of solid waste (Corcoran et al., 2010). As a result, pollution, sedimentation and erosion are increasing problems along most populated coasts of the EAME.

3.5.4. INTERNATIONAL POLITICAL RISKS

Tourism may decline when conditions in a country or region appear unsettled. Consequently, tourists tend to choose alternative destinations if they feel unsafe or in any way threatened. Political risks can be defined as forces that will cause “drastic changes in a country’s business environment that adversely affect the profit and other goals of a particular business enterprise” (Hill, 2002:67). Regional political instability may indirectly affect a country’s potential for economic growth as a result of wars and conflicts in neighbouring states. Similarly, the repercussions of political instability can lead to travel restrictions being imposed by international governments due to safety concerns and visa regulations being enforced. Table 3.17 provides a list of the international political risks that will be discussed in more detail in the following sections.

Table 3.17: International political risks

Risk Category	External Risk	Section
International political risks Section 3.5.4	Regional political instability	3.5.4.1
	Travel restrictions	3.5.4.2

3.5.4.1. Regional political instability

One of the key elements affecting tourism destinations is that countries fail to focus on the stability of their own governments, where political ideologies may impact negatively on their national interests (Brown, 2000; Hall and Oehlers, 2000). Thus, political philosophies and practices may have repercussions for tourism, creating instability (Henderson, 2007).

Tourism operators have felt the effects of perceptions that Africa is rife with violence and instability. Tourists hear of problems in Africa and think of it as one country (Wexler, 2015). Travel warnings being issued by governments to avoid areas of conflict (Smartraveller,

2016), therefore put other tourism markets in the region at risk (Booth; 2015; Brown, 2000; Brown, 2017). Douglas, Lubbe and Kruger (2012:491) state that issues hindering the South African Development Community's (SADC) development as a tourism destination of choice can be attributed to "political and security problems, unhelpful government policy for tourism in the region, and inadequate infrastructure". Naude and Saayman (2005) found that political stability, personal safety, health risks and available infrastructure are some factors that determine whether a tourist will visit the continent.

Neighbouring conflicts. The last few decades have seen new forms of conflict emerging in Sub-Saharan Africa, affecting regions and neighbouring countries. A recent study by Ansorg (2014) on regional conflict systems highlighted specific conditions that may lead to the regional spread of conflict in Sub-Saharan Africa:

- The failure of states and their lack of capacity to implement security measures which allow for economic networks and shadow economies to be established, which in turn fund war activities.
- The existence of militarised refugees arriving from neighbouring countries and inciting and spreading violence.
- The existence of weak and failed states in a region already affected by intra-state armed conflicts, acting as a catalyst for the regional spread of armed conflict.

The study shows that regional instability is encouraged by porous borders and the colonial demarcation of country borders. Additionally, regional conflicts are based on ideologies not commonly shared within the regional context, such as the emergence of al-Shabaab, which is not confined to one area, but rather a regionalisation of conflict (Ansorg, 2014).

Neighbouring conflicts have had a severe impact on Kenya's coastal tourism industry. Security problems in neighbouring Somalia have inhibited Kenya's tourism growth (Euromonitor, 2011). The closure of a number of tourist resorts along the northern sections of Kenya's coastline has had a drastic impact on tourism employment in the region. Another example where neighbouring conflicts have affected a major SDT hotspot and its local economy is in Sharm El Sheikh in the Red Sea. As a result of the neighbouring Arab Spring revolution, Egypt erupted into civil unrest and violence, drastically reducing visitor numbers in the region (Moore, 2015; Romero and Thistlethwaite, 2016). Such events have plagued

more than one market in the region, and are now spreading to previously stable markets, creating negative perceptions of the region (Rushby, 2015).

3.5.4.2. Travel restrictions

Travel advisories are often published as a measure to warn citizens travelling to foreign countries (Santana, 2001). These advisories have increasingly included references to terrorist activity, political unrest or municipal strikes, with the aim of not only encouraging safety, but also to help limit liability and insurance coverage in the event of an incident occurring (Henderson, 2007). Travel advisories against countries are often seen to have serious repercussions for countries and are fiercely resisted by governments due to the negative consequences on economies, communities, tourism businesses and neighbouring countries (Henderson, 2007).

Travel alerts are usually issued for short-term unrest or immediate threats to the safety of the citizens of countries who issue such travel warnings. The travel advisories are often a response to civil unrest, terrorist attacks or outbreaks of life-threatening diseases like the recent outbreak of Ebola. Examples of countries that issue travel warnings are the United States, Canada, Australia and a number of European countries (European Commission Consular Protection, 2017; Government of Canada, 2017; UK Foreign and Commonwealth Office, 2017; U.S Passports and International Travel, 2017). Elections in developing countries may cause violence to erupt, as observed in Kenya in early 2016 and more recently in August 2017 (News24, 2016; 2017), prompting governments to issue travel advisories. Africa represents more than a third of all countries that have travel warnings in place (US Passports and International Travel, 2016).

Visa regulations. Whyte (2009:295) describes a visa as a “pre-emptive check on the bona fides of the traveller and his travel purpose and itinerary”. Countries across Africa have various visa policies and some of them implement restrictive entry or visa policies, which can discourage travel to the EAME region. Whyte (2009) explains that visa requirements may have negative consequences for tourism because it discourages travel, affects decisions to travel, and the cost and time involved for a traveller may be significant. Tchorbadjiska (2007) adds that the administrative and financial burden imposed on travellers can result in the decline in visitor numbers from countries that require visas.

The African Development Bank recently published the Africa Visa Openness Report (AVOR, 2016) which highlighted restrictions on travel within Africa. One of the key findings was that Africans would rather travel to Europe and the US and were less willing to travel within their own continent, given the barriers and restrictions faced. These include the high cost of visas; duration and types of visa (single vs. multiple entry); ambiguity of visa processes; inflexible bureaucracy; flight costs; shortage of tourist facilities; inadequately trained staff; and access to tourist sites (AVOR, 2016). With the recent world recessions and economic crises, many countries have become more aware of the economic importance of tourism and have made efforts to encourage tourism demand by simplifying the visa application process, cutting the costs of visas or abolishing visa requirements (Gahigi, 2016; SABC, 2014; Smeral, 2009).

Tretheway and Mak (2006) explain that countries which have waived their need for a visa for business and leisure holidays have significantly improved tourism arrivals and tourism development.

South Africa, for example, came under the spotlight recently after it implemented visa regulations with the aim of improving security on its borders. One of these measures was to curb the rise of child trafficking by having parents produce unabridged birth certificates of the children they were travelling with (Booyesen, 2015). Other measures have included people having to appear in person at visa facilitation centres to provide their biometric data before they could qualify for a visa (Booyesen, 2015). The result has been a sudden decline in inbound tourism to South Africa since these measures were implemented in May 2014 (Fin24, 2015). For example, Chinese visitor numbers to South Africa dropped by 24.6% in 2014 (Traveller 24, 2015). Such impractical visa regulations have also affected relations with other countries as they limit free trade (Wangalwa, 2014).

There are, however, instances in Sub-Saharan Africa where regional travellers may travel across borders more freely as these regions have visa-free travel agreements. Nationals of East African Community (EAC) partner states (Burundi, Kenya, Rwanda, United Republic of Tanzania and Uganda) do not require visas to travel to the other EAC member states (EAC, 2013). The Southern African Development Community (SADC) countries (Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe) initiated a visa-free arrangement aimed at easing travel and facilitating trade and economic growth. Although this facilitation has occurred, there are still

visa requirements relating to tourism and travel to these individual countries, such as vaccinations for yellow fever, cholera and dysentery, and the requirement for unabridged birth certificates in the case of South Africa (SADC, 2012).

3.6. CONCLUSION

Chapter 3 comprised the second part of the literature review and discussed the external risks that face the tourism industry at large and hence could also impact on the scuba diving industry along the EAME. External risks were categorised as environmental, economic, social and political risks. For each category, its relevant direct/domestic and indirect/international risks were discussed. The next chapter investigates the research design and methodology used to explore the research objectives of this study.

CHAPTER 4

RESEARCH DESIGN AND METHODOLOGY

4.1. INTRODUCTION

This chapter describes the research methods used to in this study. The steps in the primary research process are illustrated in Table 4.1 and are discussed in this chapter. The steps outlined below are adapted from Cooper and Schindler (2008) and Conradie (2010). Step 1 deals with the phases of the research, the first phase being the structured interviews (Phase 1), followed by the structured survey (Phase 2). Step 2 addresses the identification of the study sites in the EAME region. Step 3 introduces the research paradigm and the nature of the study leading to the selection of a research design (exploratory and descriptive). This is followed by the selection and development of a sampling plan (non-parametric – purposive sampling) in Step 4. Step 5 addresses the ethical clearance for the research undertaken. Step 6 discusses the research instruments used in the gathering of primary data. Step 7 addresses the pilot testing phase before the data collection in Step 8. Step 9 deals with the data processing of the primary data collected. Steps 10 and 11 discuss the analysis of data and presentation of research findings respectively.

Table 4.1: Steps in the primary research process

Steps	Primary research process	Application to the study
Step 1 – Section 4.2	Phases of the research	Phase 1 – Structured interviews Phase 2 – Structured survey
Step 2 – Section 4.3	Study sites	Identification of study sites in the EAME region
Step 3 – Section 4.4	Research design 4.4.1 Research paradigm 4.4.2 Nature of the study 4.4.3 Select a research design	Select a research design: Post-positivism Empirical study Exploratory and descriptive
Step 4 – Section 4.5	Select and develop a sampling plan	Non-parametric – purposive sampling
Step 5 – Section 4.6	Research ethics	Ethical clearance
Step 6 – Section 4.7	Select and develop the research instrument	Structured interviews Structured survey
Step 7 – Section 4.8	Pilot testing	Conducted a pilot test
Step 8 – Section 4.9	Data collection	Phase 1 – Structured interviews (face to face) Phase 2 – Structured survey (online web survey)
Step 9 – Section 4.10	Data processing	Data editing, data coding and data capturing
Step 10 – Section 4.11	Data analysis	Discussion of analysis of data
Step 11 – Section 4.12	Presentation of research findings	Presentation and discussion of results

Source: Adapted from Conradie (2010).

4.2. PHASES OF THE RESEARCH

In order to achieve the primary aim of this study, namely, to identify the impact of external risks (environmental, economic, social, political) on dive operators' businesses in the East African Marine Ecoregion (EAME), the research was divided into two phases.

Phase 1. The first phase of the study consisted of structured interviews (Appendix A). These were conducted to identify the external risks that dive operators may be currently experiencing with the aim of gaining insights and opinions in order to construct the structured survey. The first phase occurred between July and October 2015.

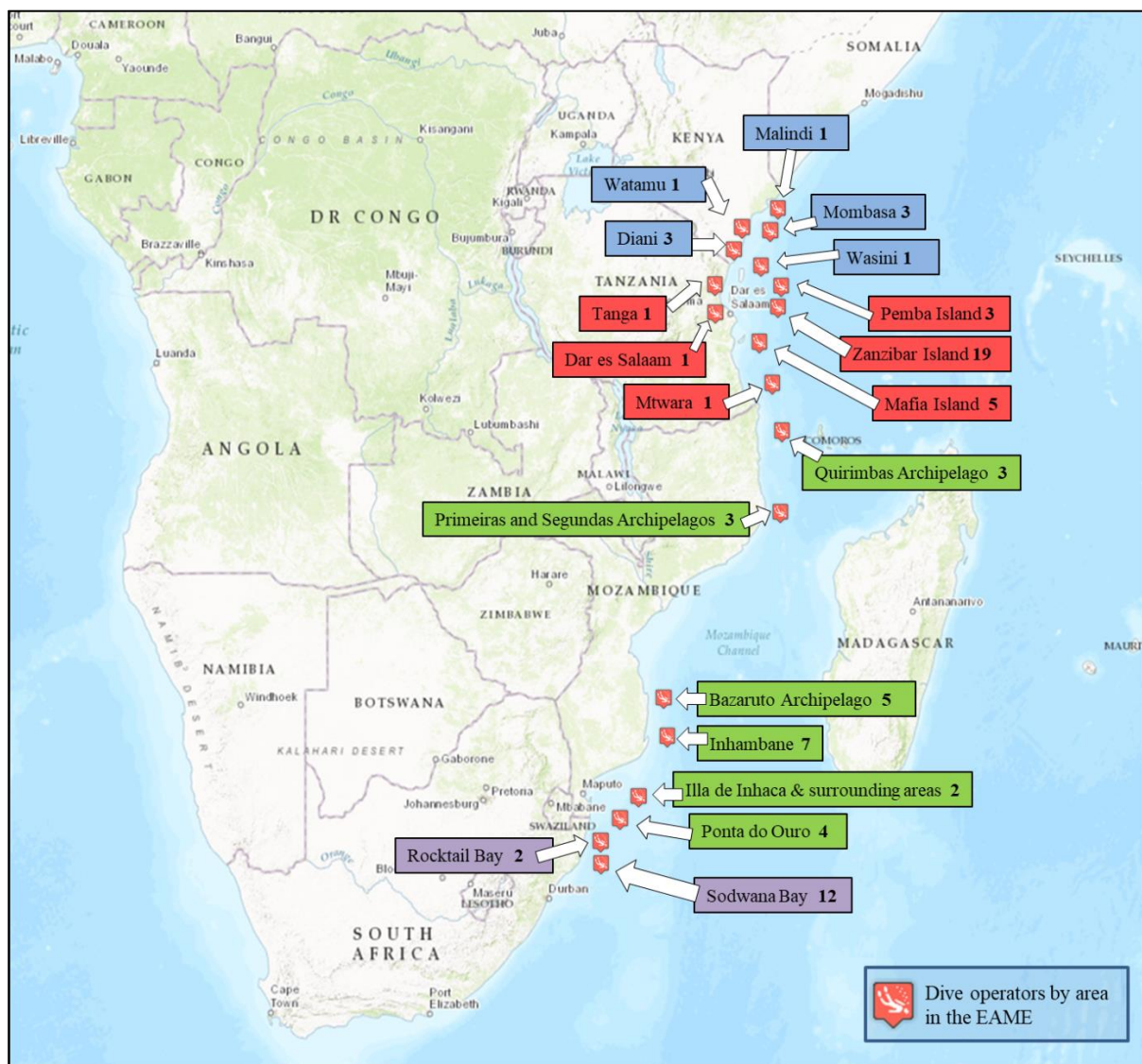
Phase 2. This phase comprised the collection of the primary data using a quantitative structured survey in the form of an online web survey. The survey was constructed based on the findings of the literature review, and supported by the results of the structured interview in Phase 1. The collection of primary data occurred between July and September 2016 (Appendix B). Study sites are discussed next.

4.3. STUDY SITES

The total geographical area covered for the scope of this study is the area defined as the Eastern African Marine Eco-region (EAME). It includes the territorial waters from northern Kenya (10° North latitude) extending south along the East African coastline to north-eastern South Africa (28° South latitude). It also includes the international waters within the 200-mile EEZ (EAME, 2004; Muthiga et al., 2008; Obura, 2005a; Oglethorpe, 2009). The distribution coverage of dive operators is limited to their proximity to coral reefs since most dive operators operate from within or in close proximity to MPAs and marine reserves (EAME, 2004; Oglethorpe, 2009; Wilkinson, 2008). All the countries (Kenya, Tanzania, Mozambique and South Africa) referred to reside within the EAME and are termed EAME countries.

Although there are many forms of MRA, this study focused on activities relevant to the dive operators' primary product offerings, namely scuba diving, which is dependent on the existence of pristine and healthy coral reef ecosystems. The purpose of selecting these dive operators is that they form part of a larger network of operators who run their dive operations within or near coral reefs mostly in or close to MPAs or marine reserves in the EAME, and have affiliations with scuba diving organisations. The dive sites and MRAs in these areas are

a major drawcard for divers, making them highly sought-after tourism destinations. However, there are various kinds of risks impacting on the dive tourism industry along the EAME coastline. The research undertaken thus involved dive operators whose businesses are directly linked to coral reefs and their surrounding marine ecosystems. Figure 4.1 maps the EAME dive operators. Each of the coloured blocks represent an area within the EAME where dive operators are congregated, with the number of dive operators in that area. The different colours represent the different countries.



Legend:

Kenya	(9)*
Tanzania	(30)*
Mozambique	(24)*
South Africa	(14)*

Figure 4.1: Location of dive operators in the EAME

*A total of 77 dive operators are located along the length of the East African Marine Ecoregion (EAME)

4.4. RESEARCH DESIGN

This section will discuss the research paradigm (Section 4.4.1), the nature of the study (Section 4.4.2) and the research design (Section 4.4.3).

4.4.1. Research paradigm

The underlying research paradigm is postpositivism. Quantitative research is generally associated with the postpositivist paradigm and usually involves collecting and converting data into numerical form so that statistical calculations can be made and conclusions drawn (Babbie, Mouton, Vorster and Prozesky, 2007; Creswell, 2014). Postpositivism emphasises determinism, reduction, empirical observation, measurement and theory verification, using scientific methods as an accepted approach to data collection (Babbie et al., 2007; Creswell, 2009). Postpositivism recognises that we cannot be ‘positive’ about our claims of knowledge when studying the behaviour and actions of humans, yet we can build on knowledge through careful observation and measurement of the objective reality that exists “out there” in the world (Creswell, 2009). Central to postpositivism is developing numerical measures for observing and studying the behaviour of individuals (Creswell, 2014).

4.4.2. Nature of the study

This study is empirical in nature and draws on an empirical research design to collect the primary data. The purpose of selecting a survey is to provide a picture of the specific details of a situation, focusing on the ‘who’, ‘what’, ‘when’, ‘where’ and ‘how’ of a topic (Cooper, Fletcher, Fyall, Gilbert and Wanhill, 2008). The researcher attempts to describe a subject by creating a profile of a group of people (Cooper and Schindler, 2008), in this case, the dive operators that have dive tourism businesses along the coast of East Africa, in the area defined as the EAME. The research design is discussed next.

4.4.3. Selection of research design

The next step in the research process entails the researcher’s selection of a research design. The research design acts as a blueprint for fulfilling research objectives and answering questions (Cooper and Schindler, 2008). The research design also addresses the type of study that will be undertaken. This is done in order to provide answers to the research problem (Mouton, 2001). The primary data was obtained from original research and consists of information collected by the researcher to fulfil the primary objective of this study (Welman, Kruger and Mitchell, 2009). As stated, the main component of this research was an empirical

study using a survey to collect primary data, as described in Figure 4.2. Mouton (2001) describes the survey as a form of research that is usually quantitative in nature, which aims to provide a broad overview of a representative sample of a population.

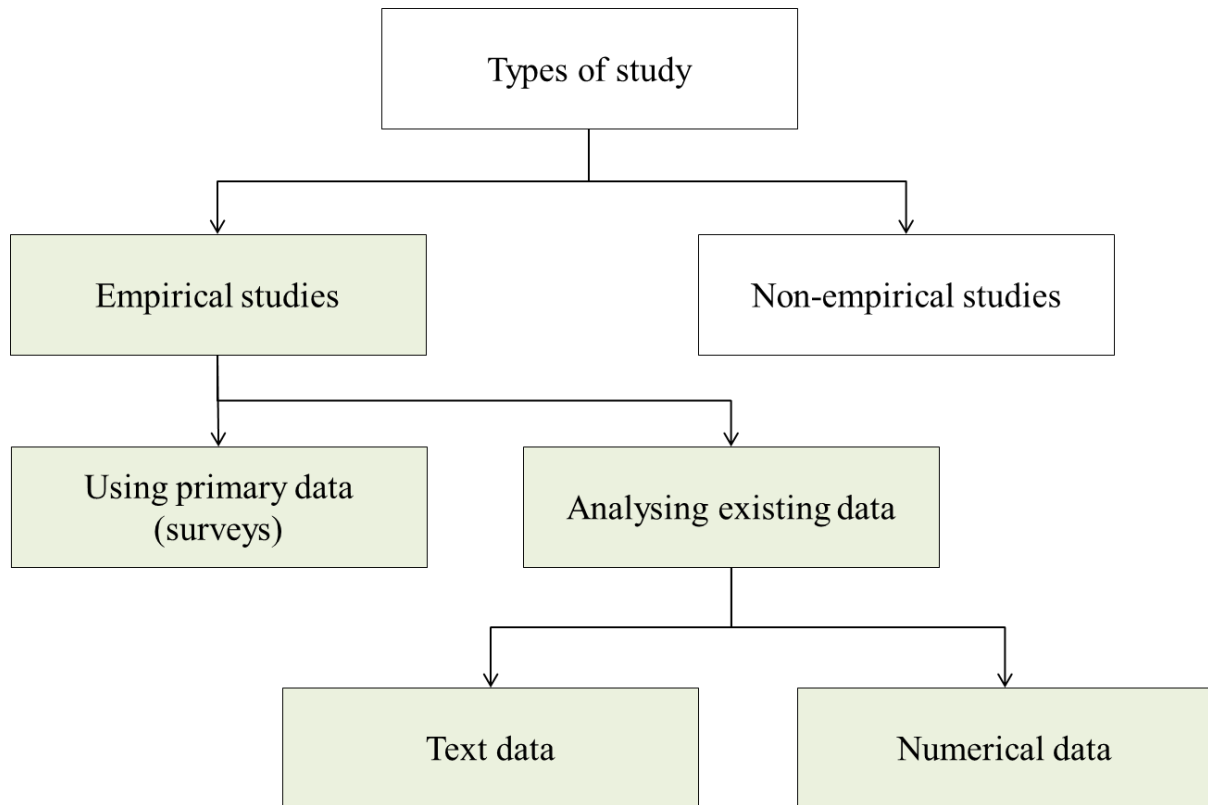


Figure 4.2: A typology of research design types

Source: Babbie et al. (2007).

This study comprises both exploratory and descriptive research design. By utilising an exploratory research design, it was hoped that the researcher would acquire new insights into a relatively unknown research area. Mouton (1996) explains that the aim of exploratory studies is to establish facts and gather new data to determine meaningful patterns in an unknown research area so as to gain new insights into the phenomenon being researched.

The “major purpose of many social scientific studies is to describe situations and events” (Babbie et al., 2007:89). Therefore, by applying a descriptive research design, the researcher was able to use existing knowledge and information available in the literature to provide detailed descriptions of the external risks presented, as well as gather details about dive operators, MPAs, and current and historical events which have relevance to this study. The sampling plan is discussed next.

4.5. SAMPLING PLAN

Once the research design was selected, a sample of the population needed to be determined. The process of selecting a sample from the population is shown in Figure 4.3.

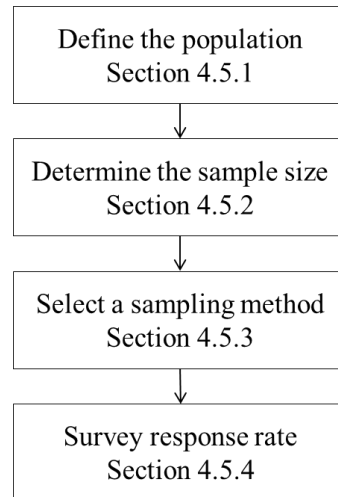


Figure 4.3: Procedure for selecting a sample

Source: Adapted from Conradie (2010).

The sampling plan will be discussed according to the steps illustrated in Figure 4.3.

4.5.1. Define the population

In order to describe the characteristics of a population, survey research requires that a target population is identified so as to make inferences about their attributes. (Babbie et al., 2007; Kumar, 2005; Leedy and Ormond, 2010). The population for this study consisted of all the dive operators with dive tourism businesses in the EAME. The following factors act as criteria for defining the population:

- the dive operators operate along the coastline of the EAME
- the dive operators operate within the geographical range of the EAME
- the dive operators operate within or nearby MPAs or marine reserves
- the dive operators use coral reefs as their primary product offering for dive tourists
- the dive operator is affiliated with a professional scuba diving organisation (e.g. Professional Association of Diving Instructors [PADI]). This ensured the presence of a legitimate dive operation.

The researcher's intention was to study the population of dive operators within the EAME along the east coast of Africa. A list of all the dive operators was compiled – this constituted

the sample frame. A sample frame is a list of the population that is being studied (Babbie et al., 2007). A list of dive operators within the EAME was compiled from various electronic and magazine resources. Online searches included drawing information from scholarly articles and travel and tourism websites. Online searches also included searching for dive operators who publish their information on scuba diving training websites such as PADI (PADI, 2015; 2017b).

Regional searches included using MPA and marine and coastal reserve websites (e.g. iSimangaliso Wetland Park, 2016; Kenya Wildlife Service [KWS] 2016; Mozambique Coastal Zone Management, 2015; Tanzania Marine Parks and Wildlife 2015), and browsing various online dive magazines (including, but not limited to Divestyle, 2015; Getaway, 2015 and Submerge, 2015). The researcher was thus able to extract, as far as possible, a population list (sample frame), allowing him to use a non-probability sampling method that considers the entire population with a particular set of characteristics. The initial investigation (including various online sources and printed publications) to determine the population resulted in 85 dive operators being identified.

4.5.2. Determine the sample size

Krejcie and Morgan's (1970) table for determining sample size from a given population shows that for a population (N) of 85 dive operators, the recommended sample size is (n) 70. Table 4.2 depicts the population and recommended sample size of the dive operators in East Africa.

Table 4.2: Population and recommended sample size of the dive operators in the EAME

Country	Population = N	Distribution %	Recommended sample size = n
Kenya	10	12.8	9 (70 X 12.8%)
Tanzania	32	37.2	26 (70 X 37.2%)
Mozambique	28	32.6	23 (70 X 32.6%)
South Africa	15	17.4	12 (70 X 17.4%)
Total	85	100	70

Source: Krejcie and Morgan (1970).

However, a further investigation concluded that not all sources of information used to determine the population were accurate. Some dive operators had closed their businesses and not updated or closed their websites, while other websites promote scuba diving activities but

are not owned by dive operators themselves, rather outsourcing this activity to actual dive operators that operate nearby.

This led the researcher to revise the population list by including additional criteria to determine the number of dive operators operating in the EAME. These additional criteria were that the dive operators

- are clustered in areas known as dive tourism hotspots
- were identified using a selection of online and print resources
- have a currently active and continuing business concern
- promote scuba diving as their primary business activity, and
- have an online presence and are contactable via email or telephone.

This investigation concluded that the number of actual dive operators was less than initially calculated. As a result of the above exercise, the sampling frame decreased from 85 to 77 dive operators. Thus, according to Krejcie and Morgan’s (1970) table for determining sample size from a given population, the population (N) was recalculated based on a population of 77 dive operators, which provided a recommended sample size of (n) 63. Finally, given that the population (N) was small (77), the decision was made by the researcher to include all dive operators in the sample size (n) (77) for the purposes of this study. Table 4.3 illustrates the revised and actual population (N) and sample size (n).

Table 4.3: Revised population, sample size and actual sample size of the dive operators in the EAME

Country	Population = N	Percentage distribution	Recommended sample size	Actual sample size = n
Kenya	9	11.7	7 (63 X 11.7%)	9
Tanzania	30	39.0	24 (63 X 39%)	30
Mozambique	24	31.1	20 (63 X 31.1%)	24
South Africa	14	18.2	12 (63 X 18.2%)	14
Total	77	100	63	77

Source: Krejcie and Morgan (1970).

The actual sample size was slightly larger than the recommended sample size. A 100% sample was drawn from the total population. The selection of a sampling method is discussed next.

4.5.3. Select a sampling method

Sampling methods are divided into two main groups, probability and non-probability sampling (Blaxter, Hughes and Tight, 2008). The sampling method used was dependent on several factors, such as the objectives of the study; the nature of the research problem; financial resources; time limit of the study; and the knowledge of the population (Blaxter et al. 2008). Table 4.4 provides a list of different types of sampling methods.

Table 4.4: Probability and non-probability sampling methods

Probability sampling methods	Non-probability sampling methods
Simple random sampling	Convenience sampling
Systematic sampling	Voluntary sampling
Stratified sampling	Quota sampling
Cluster sampling	Purposive sampling
Stage sampling	Dimensional sampling
	Snowball sampling

Source: Blaxter et al. (2008).

The sampling method selected for this study was non-probability sampling. Non-probability methods allow the researcher to offer his/her best judgement in obtaining results in a manner that they deem to be representative of the relevant population (Welman et al., 2009) and provide good estimates of the characteristics of the population (Babbie et al., 2007).

Purposive sampling was chosen as a sampling method for the purposes of this study. Purposive sampling can be described as selecting “a group of people because you know they have some traits you want to study” (Nardi, 2006). Purposive sampling is used for studies where “the researcher purposefully selects individuals, groups and settings that maximise understanding of the underlying phenomenon” (Onwuegbuzie and Collins, 2007). With purposive sampling, respondents are selected for a particular purpose (Leedy and Ormond, 2010; Neuman, 2007). The process followed to compile a list of dive operators is discussed in Sections 4.5.1 and 4.5.2. Each dive operator on the final list was contacted and was given the opportunity to participate in the survey.

4.5.4. Survey response rate

The structured survey (online survey) was emailed as a web link to 77 dive operators in four countries along the East African coast. Data collection took place between July and

September 2016. These dive operators all had businesses within what is characterised as the EAME, along the east coast of Africa, and met the criteria outlined in Sections 4.5.1 and 4.5.2. As a result of not getting a sufficient response rate from the online survey, the researcher travelled to the areas along the EAME where the response rate was low and handed out the surveys to the dive operators (manual survey). Table 4.5 shows the countries from which the dive operator responses were collected.

Table 4.5: Response rate per country and the total responses received.

	Kenya	Tanzania	Mozambique	South Africa	Total
All respondents	9	30	24	14	77
Respondents who answered	7	10	8	9	34
Sample response rate (%)	77.77	33.33	33.33	64.28	44.16
Response rate per country (%)	20.59	29.41	23.53	26.47	100

The total number of surveys returned from both the web-based structured survey and the manual structured surveys was 34 (44%). With the web-based structured survey, 22 surveys were completed online, with an online response rate of 65%. From the manual structured surveys, 12 surveys were completed, with a response rate of 35%. Nulty (2008) stipulates that an adequate response rate for online surveys can be achieved for samples with a small population size and that great care is needed to be sure that the results are representative of the whole group. By obtaining 34 surveys, the researcher exceeded the minimum required response rate of 20.

4.6. RESEARCH ETHICS

Prior to the collection of any data, the researcher gained ethical clearance from the University of South Africa (UNISA). Denscombe (2007) states that the researcher needs to gain permission by those in authority before a survey may be conducted. The ethical principles of voluntary and informed participation, confidentiality, anonymity and non-harm were considered when conducting the research, and were clearly communicated to respondents in the participant information sheet and informed consent form (De Vos, Strydom, Fouché and Delpont, 2007).

The masters proposal was submitted in July 2015, and after some revisions from the Ethics Committee of the School of Economic Sciences, on 4 August 2015, in compliance with the

UNISA Policy on Research Ethics, ethical clearance for the research was granted. The ethical clearance certificate is in Appendix C.

Before conducting structured interviews in **Phase 1**, the respondents were asked to give consent to being interviewed. A copy of the ethical clearance certificate was handed to the respondents for them to read through.

Before participating in the structured survey (**Phase 2**), the ethical principles were also communicated to the respondents. The participant information sheet and informed consent form (as required by the School of Economic Sciences Research Ethics Review Committee) was incorporated into the Introduction page of the survey. Participants were required to acknowledge having given their consent by ticking the 'Yes' tick box on the Introduction page of the structured survey (see Appendix B).

This acknowledgment indicated that the respondents had read and understood the purpose of the survey; understood that their participation was voluntary and they could withdraw from the study at any time; and were made aware that the findings of the study would be anonymously processed into a research report, journal publication and/or conference proceedings. With these principles in place, the researcher thus satisfied the ethical requirements for conducting the research. Pilot testing could then commence.

4.7. RESEARCH INSTRUMENT

The next step in the primary research process was the selection and development of the appropriate research instrument to fulfil the requirements of this study. Research instruments are utilised to form the basis and conclusions of a study (Kumar, 2005). With this in mind, two types of research instrument were selected.

For **Phase 1**, a structured interview was used. This comprised a face-to-face qualitative interview. Qualitative interviews allow for open-ended questions with the intent to elicit views and opinions from the participants (Creswell, 2014). A list of questions was grouped into sections. The following sections were covered: dive operator information; environmental risks; economic risks; social risks; political risks; current dive tourism business risks, and scuba diver tourist information. The questions were derived from existing literature and presented in a table in preparation for discussion with the dive operators (Appendix A). The questions were formulated from the existing literature with regard to external risks present in:

- the dive tourism industry (in the EAME and globally)
- in Africa as a region and, more specifically,
- in Kenya, Tanzania, Mozambique and South Africa (EAME region).

The results gathered from **Phase 1** helped to formulate the relevant external risks for dive operators in the EAME and to prepare **Phase 2** of this study. Table 4.6 shows:

1. a list of all the **questions** contained in the structured survey (Appendix B).
2. for each question, the **source/s** consulted to design that question (in the adjacent column).
3. how the structured survey was **shaped** from the results of the structured interviews (last column).

Table 4.6: Shaping of the structured survey from Phase 1

Question in structured survey (Phase 2) (Appendix B)	Source/s of the question	How Phase 1 (Appendix A) shaped the questions asked in Phase 2
Section 2 to 7: Dive operator demographics		
<p>Question 2 to 6</p> <p>In which country of East African Marine Ecoregion (EAME) is your dive operation situated?</p>	<p>Divestyle, 2015; Getaway, 2015; PADI, 2015; PADI, 2017a; Scuba Travel, 2017; Submerge, 2015</p>	<p>Various sources were used to identify all dive operators in the EAME region. Sentence slightly re-worded compared to how it was in the structured interview.</p>
<p>Question 7</p> <p>How many years has your dive operation been in operation?</p>		<p>To determine length of time in business. This question remained unchanged from structured interview.</p>
<p>Question 8</p> <p>What percentage of your income is generated from scuba diving?</p>		<p>To determine percentage revenue earned from scuba diving activities on coral reefs. This question remained unchanged.</p>
<p>Question 9</p> <p>What percentage of your dive operation's scuba diving activities occur on coral reefs?</p>		<p>The structured interview also included a question on what the main drawcard is for dive tourists who visit the region (coral reefs, underwater photography, sharks, whales and dolphins, wreck diving, etc.). Although interesting, it was not included as part of the structured survey as it was not relevant to any of the secondary research objectives. The question in the left-hand column remained the same as in the structured interview.</p>
<p>Question 10</p> <p>Do you operate within or nearby a Marine Protected Area (MPA) or Marine Reserve? Name it.</p>	<p>Harriott et al., 1997; Thurstan et al., 2012</p>	<p>Remained as in structured interview.</p>
<p>Question 11</p> <p>Origin of scuba divers that dive with your business?</p> <ul style="list-style-type: none"> • Local (domestic tourists) • Africa • Asia • Australia and New Zealand (Oceania) • Europe • Middle East • North America • South America 	<p>UNWTO, 2015a; WTTC, 2015a; WTTC, 2015b</p>	<p>Remained as in structured interview.</p>

Table 4.6: Shaping of the structured survey from Phase 1 (cont'd)

Question in structured survey (Phase 2) (Appendix B)	Source/s of the question	How Phase 1 (Appendix A) shaped the questions asked in Phase 2
Section 8: Environmental risks – Burke et al., 2011; Henderson, 2007; Richmond, 2011; Shaw, 2010		
<p>Question 12</p> <p>What level of impact on coral reefs do the following direct environmental risks have on your dive operation?</p> <ul style="list-style-type: none"> • Tourism overuse: diver impacts (breaking coral; high dive numbers on dive sites; anchor damage) • Tourism overuse: coastal development impacting on coral reef ecosystems • Overfishing (on or near to coral reefs) • Destructive fishing (on or near to coral reefs) • Sedimentation (excessive sand deposits on reefs from river run-off, storms and wave action etc.) • Eutrophication (excess algal growth on coral reefs) • Coral mining (extracting coral for commercial gain) • Marine pollution: industrial and municipal discharge of waste • Marine pollution: floating marine debris (plastics, fishing gear debris etc.) • Extraction of coral fauna and flora: (for aquarium trade, coral for limestone, curios etc.) 	<p>Cesar et al., 2003; Dimmock and Musa, 2015</p> <p>Burke et al., 2011; Hinrichsen, 2011; Richmond, 2011</p> <p>Burke, et al. 2011; FAO, 2014</p> <p>Obura, 2005a; Richmond, 2011</p> <p>ICRAN, 2010; Obura, 2005a</p> <p>Hoekstra et al. 2010; Richmond, 2011</p> <p>Richmond, 2011</p> <p>Corcoran et al. 2010; ICRI/UNEP-WCMC, 2010</p> <p>Burke et al. 2011; Paterson et al. 2012</p> <p>CITES, 2013; Richmond, 2011</p>	<p>Remained as in structured interview.</p> <p>Tourism overuse was split into two external risks after the structured interviews; the first being diver impacts, and the second coastal development. Anchor damage was excluded as it formed part of tourism overuse: diver impacts.</p> <p>Terrestrial pollution was excluded, but marine pollution was split into two external risks which encompassed pollution sources from land, and pollution sources from human activities in the oceans.</p> <p>The researcher also added extraction of marine resources as an external risk as dive operators interviewed in Tanzania and Mozambique felt this was an on-going problem.</p>

Table 4.6: Shaping of the structured survey from Phase 1 (cont'd)

Question in structured survey (Phase 2) (Appendix B)	Source/s of the question	How Phase 1 (Appendix A) shaped the questions asked in Phase 2
<p>Question 13</p> <p>What level of impact on coral reefs do the following indirect environmental risks have on your dive operation?</p> <ul style="list-style-type: none"> • Coral bleaching (due to SST rise, El Niño, etc.) • Sea level rise • Ocean acidification (altering coral and shellfish structure) • Extreme weather events (tropical cyclones, floods, etc.) • Industrialisation of coastal regions (ports, harbours, effluent, etc.) • Increased shipping and boating (damaging reefs, bilge water pollution, alien species, etc.) • Marine pollution (plastics, marine debris, etc.) 	<p>AIMS, 2016; NOAA, 2016; Obura, 2005b; Uyarra, Cote, Gill, Tinch, Viner and Watkinson. 2005</p> <p>Nicholls and Cazaneve, 2010</p> <p>Jury et al. 2010</p> <p>Fischer and Knutti, 2015</p> <p>Edgar, 2015; Mutambo, 2016b</p> <p>Golgowski, 2015; Howard, 2016; Rappler.com, 2016</p> <p>Baztan et al., 2016; Pereira et al., 2014</p>	<p>Remained as in structured interview.</p> <p>El Niño was added under coral bleaching as it is more directly related to SST.</p> <p>Coastal development was split into industrialisation of coastal regions and increased shipping and boating.</p>
<p>Question 14</p> <p>In future, do you expect coral reef degradation to:</p> <ul style="list-style-type: none"> • Decrease in occurrence • Occur with the same frequency • Occur more often • Not sure 	<p>Burke et al., 2011; Hinrichsen, 2011; IUCN, 2004; Richmond, 2011</p>	<p>Remained as in structured interview.</p>

Table 4.6: Shaping of the structured survey from Phase 1 (cont'd)

Question in structured survey (Phase 2) (Appendix B)	Source/s of the question	How Phase 1 (Appendix A) shaped the questions asked in Phase 2
<p>Question 15</p> <p>If coral reef degradation continues in your area, how long do you expect your dive business to continue operating?</p> <ul style="list-style-type: none"> • Unsustainable: Close business immediately • Close business within a year • Close business within 5 years • Can continue to operate indefinitely • Can survive if there is no more coral reef degradation • Not sure 	<p>Burke et al., 2011; Hinrichsen, 2011; IUCN, 2004; Richmond, 2011</p>	<p>Remained as in structured interview.</p>
<p>Question 16</p> <p>In your opinion, would these environmental risks influence the decision for dive tourists to travel to your country/region?</p>	<p>Crang, 2014; Lew, 2013; Lucrezi, et al., 2013; Lowe et al., 2012; Paterson et al., 2012; Uyarra et al., 2009</p>	<p>Remained as in structured interview.</p>
<p>Section 9: Economic risks - Henderson, 2007; Lejarraja and Walkenhorst, 2007; Shaw, 2010</p>		
<p>Question 17</p> <p>What level of impact on coral reefs do the following domestic economic risks have on your dive operation?</p> <ul style="list-style-type: none"> • High fuel prices • Increasing interest rates (higher cost of borrowing). • Price inflation (more expensive to run business, price increases, etc.) • Depressed local economic activity • Economic impact as a result of coral reef degradation 	<p>Yong, 2014</p> <p>Grishchenko and Huang, 2012</p> <p>Shaw, 2010; Yong, 2014</p> <p>Volgraaff, 2016</p> <p>Burke et al. 2011; Hawkins et al. 2005; Richmond, 2011; Ríos-Jara et al. 2013</p>	<p>Wording of the question changed slightly after the structured interviews.</p> <p>High oil prices were placed in the domestic economic risks category.</p> <p>Higher transport costs were grouped under high fuel prices.</p> <p>Price inflation was added given its close linkage high fuel prices.</p> <p>Depressed local economic activity emerged as a theme which is impacting on dive operators and was therefore added as a domestic economic risk.</p> <p>The economic impact as a result of coral reef degradation is also an important theme that came up in discussions during the structured interviews and was added to the list of domestic economic risks.</p>

Table 4.6: Shaping of the structured survey from Phase 1 (cont'd)

Question in structured survey (Phase 2) (Appendix B)	Source/s of the question	How Phase 1 (Appendix A) shaped the questions asked in Phase 2
<p>Question 18</p> <p>What level of impact on coral reefs do the following international economic risks have on your dive operation?</p> <ul style="list-style-type: none"> • Economic recessions (slowdown in global economic activity) • Financial crises (2008 financial crises, stock market collapse, Brexit, etc.) • Price competitiveness (tourist affordability of scuba diving products and services, increased operating costs, etc.) • High exchange rates (stronger Euro, Dollar, etc.) • Dive tourist accessibility (limited access to dive locations, increasing travel and accommodation costs, poor road conditions, etc.) 	<p>Eugenio-Martin and Campos-Soria, 2013</p> <p>Candela and Figini, 2012; Pento, 2016; UNWTO, 2011</p> <p>Forsyth and Dwyer, 2009; George, 2008</p> <p>Mapenzauswa, 2015; Oxley and Buecking, 2015; Sandle, 2016</p> <p>Griffin and Edwards, 2012; Pearce and Schänzel (2013)</p>	<p>Sentence structure was amended after the structured interviews.</p> <p>Price Competitiveness was moved here from domestic economic risks.</p> <p>Dive tourist accessibility was added after the structured interviews as it emerged that these barriers exist for dive tourists.</p>
<p>Question 19</p> <p>In your opinion, would these economic risks influence the decision for dive tourists to travel to your country/region?</p>	<p>Eugenio-Martin and Campos-Soria, 2013; Lejarraja and Walkenhorst, 2007</p>	<p>Question remained as in structured interview.</p>
<p>Section 10: Social risks - Henderson, 2007; Honey and Krantz, 2007; Richmond, 2011</p>		
<p>Question 20</p> <p>What level of impact on coral reefs do the following domestic social risks have on your dive operation?</p> <ul style="list-style-type: none"> • Local health and disease epidemics (malaria, HIV/AIDS, food and water-borne diseases, etc.) • Crime (theft, violence, xenophobia, etc.) 	<p>Paris, 2014; Kelland, 2014</p> <p>Lorde and Jackman, 2013</p>	<p>Sentence structure was amended after the structured interviews.</p> <p>Xenophobia was added as a crime</p>

Table 4.6: Shaping of the structured survey from Phase 1 (cont'd)

Question in structured survey (Phase 2) (Appendix B)	Source/s of the question	How Phase 1 (Appendix A) shaped the questions asked in Phase 2
<p>Question 20 cont'd</p> <ul style="list-style-type: none"> • Increased dependency on marine resources by communities (degradation of coral biodiversity) • Population growth along the coast • Rising unemployment 	<p>Burke et al., 2011; Hinrichsen, 2011; Richmond, 2011; UNEP/WCMC, 2003</p> <p>Baker, 2014; Tairo, 2015; World Bank, 2009</p> <p>Hofmeyer, 2013</p>	<p>Coastal development in the structured interview was amended. This was split into increased dependency on marine resources, population growth and rising unemployment.</p>
<p>Question 21</p> <p>What level of impact on coral reefs do the following domestic social risks have on your dive operation?</p> <ul style="list-style-type: none"> • Global disease epidemics (Ebola virus, cholera, Zika virus, etc.) • International crime (terrorism, piracy, etc.) • Coastal migration 	<p>Hinrichsen, 2011; Paula and Schleyer, 2009; UN, 2011</p> <p>Brown, 2017; CSIS, 2016</p> <p>Goble et al., 2014</p>	<p>Sentence structure was amended after the structured interviews.</p> <p>Terrorism was added to international crime and removed from domestic crime.</p>
<p>Question 22</p> <p>In your opinion, would these social risks influence the decision for dive tourists to travel to your country/region?</p>	<p>Henderson, 2007</p>	<p>The question remained as in structured interview.</p>
<p>Section 11: Political risks – Booth, 2015; Henderson, 2007, Shaw, 2010</p>		
<p>Question 23</p> <p>What level of impact on coral reefs do the following domestic political risks have on your dive operation?</p> <ul style="list-style-type: none"> • Political instability • Restrictive government regulations • Lack of MPA regulations • Restrictive MPA regulations • Government corruption • Lack of service delivery 	<p>OSAC, 2015; WPR, 2016</p> <p>Terk and Knowlton, 2010</p> <p>Hinch and Higham, 2011 Rocliffe and Udelhoven, 2010</p> <p>Balli et al. 2016 Grossi and Pianezzi, 2016</p> <p>Chen and Chen, 2016</p>	<p>The question wording was changed after the structured interviews.</p> <p>Political corruption was changed to political instability.</p> <p>Restrictive government regulations were added.</p> <p>Lack of conservation enforcement was rephrased as lack of MPA regulations. Restrictive government regulations were added.</p> <p>Political corruption was rephrased as government corruption.</p> <p>Lack of government action was rephrased as lack of service delivery.</p>

Table 4.6: Shaping of the structured survey from Phase 1 (cont'd)

Question in structured survey (Phase 2) (Appendix B)	Source/s of the question	How Phase 1 (Appendix A) shaped the questions asked in Phase 2
<p>Question 23 cont'd</p> <ul style="list-style-type: none"> • Civil unrest and/or strikes 	<p>Must and Rustad, 2016</p>	<p>Civil unrest and/or strikes was added. Lack of infrastructure development was deleted.</p>
<p>Question 24</p> <p>What level of impact on coral reefs do the following international political risks have on your dive operation?</p> <ul style="list-style-type: none"> • Neighbouring conflicts (wars, ISIS threat, etc.) • Regional political instability • Strict visa regulations (more difficult for dive tourists to enter country, unabridged birth certificates, etc.) • Travel restrictions (for example, US or EU issuing travel advisories as a result of terrorism threat, civil unrest, etc.) 	<p>Ansorg, 2014; Rushby, 2015</p> <p>UNWTO, 2015b</p> <p>Gahigi, 2016</p> <p>European Commission Consular Protection, 2017; Government of Canada, 2017; UK Foreign and Commonwealth Office, 2017; U.S Passports and International Travel, 2017.</p>	<p>Question wording was amended after the structured interviews.</p> <p>Neighbouring conflicts was added.</p> <p>Travel restrictions was added.</p>
<p>Question 25</p> <p>Do you feel these political risks would influence a dive tourist's decision to travel to the region?</p>		<p>Question remained the same as in structured interviews.</p>
Section 12: Risk categories		
<p>Question 26</p> <p>Which risk category do you feel has the biggest impact on your dive operation presently?</p>		<p>Question was added.</p>
<p>Question 27</p> <p>Which risk category do you feel will have the biggest impact on your dive operation in future?</p>		<p>Question was added.</p>

Table 4.6: Shaping of the structured survey from Phase 1 (cont'd)

Question in structured survey (Phase 2) (Appendix B)	Source/s of the question	How Phase 1 (Appendix A) shaped the questions asked in Phase 2
<p>Question 28</p> <p>In conclusion, given the above risks, have you considered any adaptation strategies to ensure the long-term viability of your dive operation?</p> <ul style="list-style-type: none"> • Have not looked into it • Have found no solutions to these risks • Have considered adaptation strategies but not implemented any • Have implemented some strategies to mitigate some risks • Have applied sufficient strategies to ensure the long-term viability of my dive operation 		<p>Question was amended to include different options.</p>

Once the structured interviews were completed and the information analysed, several risks were identified that had not initially been considered by the researcher. The risks added following Phase 1 are set out in Table 4.6. Existing literature as well as the knowledge gained from the interviews were used to develop the structured survey (as detailed in the table above) and additional external risks relevant to the dive tourism industry in the EAME were included. This process added rigour to the process of developing the structured survey.

In **Phase 2**, the structured survey was finalised in order to answer the primary and secondary research objectives. The underlying principle in constructing a structured survey is to ensure that the questions relate to the research objectives of the study (Kumar, 2005). The link between the research objectives and the structured survey is outlined in Table 4.7.

Table 4.7: Research objectives aligned to sections in the structured survey

Secondary research objective	Research objective of the study	Section of the structured survey		Question number
1	Identify the scuba diving operators in the EAME and their scope of operation	2–7	Dive operator information	2–11
2	Determine the external risks most relevant to dive operators in the EAME and assess their level of impact	8–11	Environmental risks Economic risks Social risks Political risks	12, 13, 14, 15, 17, 18, 20, 21, 23, 24
3	Compare individual external risks experienced by each of the countries in the EAME (Kenya, Tanzania, Mozambique and South Africa) using a cross-case analysis	8 9 10 11 12	Environmental risks Economic risks Social risks Political risks Risk categories	12, 13, 17, 18, 20, 21, 23, 24, 26, 27, 28
4	Assess the perception of dive operators regarding whether external risks would influence a dive tourist's decision to travel to the dive operator's area of operation in the EAME	8 9 10 11	Environmental risks Economic risks Social risks Political risks	16 19 22 25

The structured survey consisted of 28 questions developed specifically for the purposes of this study. These questions were created by identifying pertinent aspects of the existing literature and by extracting the key external risks from the structured interviews. The structured interviews served to confirm what the literature stated about external risks and dive tourism, with some further additions (Table 4.6). The formulation of questions used in the structured survey will now be discussed:

In Section 1, the respondents were asked whether they consented to participate in the web survey. By clicking 'Yes', they were immediately taken to Section 2.

Sections 2 to 7 consider the biographical information of the dive operators. These sections identify:

1. The geographical region of dive operators along the coast of East Africa in the EAME region. The questions in this section determine both the country and the region of operation. This is an important consideration when determining variations in statistical analysis. For example, different dive operators in various regions of the EAME may experience similar or differing trends in how they perceive or respond to external risks. Identifying location is also a means of determining dive tourism hotspots where dive operators are clustered together based on location and access to dive sites.

2. The number of years that a dive operation has been in business provides an understanding of the sustainability of the dive tourism industry in the EAME.
3. The percentage of income generated from scuba diving activities can provide insights into the dive operator's dependency on coral reefs.
4. The percentage use of coral reefs for scuba diving is an indicator of the dive operator's dependency on coral reefs.
5. Operators' proximity to MPAs and/or marine reserves is an indication of how reliant they are on the protection of these environments.
6. Identifying the scuba diver tourists' region of origin helps to determine the relationship between domestic and international tourists and the effect that domestic risks and international risks have on tourists' decisions to travel to regions within the EAME.

A Likert scale was used in Sections 8, 9, 10 and 11, on which the respondents had to indicate the importance of each risk type. This was presented on a scale from 1 = No Impact; 2 = Low Impact; 3 = Moderate Impact; 4 = High Impact and 5 = Very High Impact.

Sections 8, 9, 10 and 11 of the structured survey sought to determine direct/domestic and indirect/international environmental, economic, social and political external risks that would likely have an impact on dive operators' businesses in East Africa.

Questions 16, 19, 22, and 25 in Sections 8, 9, 10, and 11 were designed to assess whether the external risks, that is, environmental, economic, social and political risks, would influence dive tourists' decisions to travel to the dive operator's location in East Africa.

Section 12, the summary page, was formulated to determine which risk categories have the biggest current impact on dive operators' businesses and which of those risk categories are anticipated to have the biggest impact in the future. The final question in Section 12 was aimed at drawing inferences on whether dive operators had considered and/or applied adaptation strategies to mitigate the external risks that they had identified.

Once the structured survey was developed it was tested by conducting a pilot study.

4.8. PILOT TESTING

A pilot survey was conducted prior to sending out the structured survey to all the dive operators in the EAME. Pilot testing, according to Kumar (2005), is an integral part of

developing a research instrument. One of the most crucial elements in constructing a research instrument is to ensure the questions are understood consistently by all respondents (Finn, Elliott-White and Walton, 2000). Prior to sending out the pilot survey, it was sent out to the researcher's supervisors, a statistician as well as an independent researcher to determine if the construction of the research instrument was sound and held validity (peer review).

The pilot was then conducted with a group of dive operators to determine if the questions had acceptable relevance to the diving industry in the EAME and to ascertain the time required to answer the web survey, its ease of navigation, and if any further questions needed to be included which the researcher may have overlooked. Four dive operators, who had good knowledge of the dive industry in the EAME and could provide valuable input for guiding the researcher, were selected for the pilot test. Two were located in Johannesburg and undertook the pilot in the form of a manual survey. Since the researcher is based in Johannesburg, this allowed for a quick response and was cost-effective. The other two dive operators were located in Sodwana Bay, and answered the survey in the form of a web survey via a link in an email. The feedback and comments received were very constructive and, based on these, the researcher made the necessary minor amendments to the structured survey. Prior to distributing the structured survey to the respondents, the final version was presented to the researcher's supervisors, and once final approval was obtained, the structured survey was distributed to all dive operators in the EAME. The data collection procedure will be discussed next.

4.9. DATA COLLECTION

This section will discuss the methods employed to collect data in order to achieve the primary and secondary objectives of this study. As indicated in Section 4.2, the approaches to collecting data consisted of two phases. **Phase 1** (discussed in 4.9.1) was a structured interview to determine which risks are most relevant to dive operators in the EAME and to aid in the construction of the primary research instrument (structured survey – **Phase 2**). As mentioned, **Phase 2** consisted of a structured survey for the collection of primary data (discussed in Section 4.9.2). Both the interview and the survey are methods promoted by Cooper and Schindler (2008:224) for the collection of primary data.

In addition, Cooper and Schindler (2008) state that the environment in which data is collected can be in a field setting or under actual environmental conditions. This study took place under

actual environmental conditions. The fieldwork for Phase 1 was conducted between July and October 2015, when the researcher travelled along the east coast of Africa to Kenya, Tanzania, Mozambique and South Africa, to interview selected dive operators personally. The collection of primary data for Phase 2 was conducted between July and September 2016. Phase 1 and Phase 2 are discussed separately below.

4.9.1. Phase 1 - Structured interviews

As previously explained in Sections 4.2 and 4.7, the structured interviews were conducted to identify which external risks were relevant to achieving the primary objective of the study, and thus needed to be probed (see Table 4.6). Structured interviews can provide detailed information on the attitudes of stakeholders to tourism issues and changes in tourism destination areas (Yuksel, Bramwell and Yuksel, 1999). The interview protocol included having a prepared set of questions covering relevant topics. The following sections were covered: dive operator information; environmental risks; economic risks; social risks; political risks; current dive tourism business risks, and scuba diver tourist information. The allotted time for each interview was one hour, but this usually ran over as the discussion with each dive operator was expounded into more detail. The structured interview for **Phase 1** is provided in Appendix A.

Although the structured interviews were a fixed set of questions, the researcher probed for more detail by asking the dive operator to elaborate on certain topics. This allowed for more flexibility, and enabled the researcher to deviate from fixed questioning. It also allowed the dive operator to elaborate on various topics as well as to raise other themes which may not have been considered beforehand but could be of relevance to the study (Creswell, Plano Clark and Garrett, 2008) (see Table 4.6).

The dive operators selected for the structured interviews were chosen using online and print media. They were chosen based on their perceived presence in the region and knowledge gained over their years of operation. Table 4.8 shows the length of time that the four dive operators who were interviewed had been established in their area of operation.

Table 4.8: Dive operators selected for structured interviews based on years in operation.

Dive operator location	Number of years in operation (established)	Region of East Africa
Mombasa	14 (2002)	Kenya
Zanzibar	21 (1995)	Tanzania
Ponta do Ouro	26 (1990)	Mozambique
Sodwana Bay	22 (1994)	South Africa

The structured interview helped to determine the external risks most relevant to this study and the results obtained subsequently enabled the researcher to classify the identified individual external risks into risk categories (i.e. environmental, economic, social and political). Once the structured interviews were complete, the next phase of the research process was to prepare the structured survey for the collection of the primary data.

4.9.2. Phase 2 - Structured survey

For the purposes of this study, a structured survey was developed. Surveys are used in research that asks participants direct questions (Finn et al., 2000). They are usually quantitative in nature and aim to provide a broad overview of a representative sample of a larger population (Mouton, 2001). While it is not always possible to know the population, it is possible that the sample can provide linkages to a known population. The following discussion on the data collection briefly highlights the control of variables, the time dimension and the topical scope.

Control of variables. An ex post facto design was applied, allowing the researcher to report on the findings present within the context of this study (historical or current events) (Cooper et al., 2008).

The time dimension. The time dimension applied in this study was to examine the current state of events. Neuman (2007) states that a cross-sectional study examines a snapshot taken at a single point in time. Cooper and Schindler (2008) state that studies observed at one point on a current time scale can only be done once. Hence, this study was conducted only once, between July and September 2016.

The topical scope. According to Cooper and Schindler (2008), statistical analysis serves to deduce the breadth of information gathered. This study used statistical methods to interpret the primary data. The structured survey administered in **Phase 2** took the form of an online

survey, which is a common and popular method for collecting data because it is inexpensive, is less time consuming, could be efficiently geographically disbursed across the EAME, enabled the researcher to make sense of the data almost immediately as it was collected and the resulting data could be easily disseminated and reported on (Nardi, 2006).

The online web survey was designed using Survey Monkey[®]. Administrative costs were low as all the preparation work and the data collection were automatically updated on Survey Monkey[®], negating the need to enter data manually on a separate database (Evans and Mathur, 2005; Roberts, 2007). This was ideal since dive operators are sometimes located in remote areas and are heavily dependent on internet access. The web survey is also aesthetically pleasing, and allows the look and feel to be highly customisable (Bryman, Teevan and Bell, 2009). The researcher used the skip logic tool that is available on Survey Monkey[®] to ensure that participants did not need to page through questions which were not relevant.

The online survey was distributed from the Survey Monkey[®] website to 77 dive operators in the form of a web link. The research procedure consisted of the surveys being sent to the respondents via an automated e-mailing system on Survey Monkey[®] followed by an e-mail reminder, once a week, over a two-week period. Following this, the researcher attempted to contact respondents who had not yet replied telephonically. Twenty-two (22) surveys were returned via the online approach. Nulty (2008) suggests that in order to present data that maximises the probability of needing the lowest response rates, liberal conditions⁵ can be set. Using this approach, the required response rate can be between 19 to 20 respondents out of a population between 70 and 80. However, the researcher felt that the 22 surveys were insufficient for the data to be statistically significant. The researcher therefore travelled to Kenya (Diani, Mombasa and Kisite), Tanzania (Zanzibar), Mozambique (Ponta do Ouro and Ponta Malongane) and South Africa (Sodwana Bay) to personally administer the survey to the dive operators who had not yet responded. The surveys were printed out in the same format as the web survey, and were presented to the dive operators, who completed them manually. In this way, 12 manual surveys were completed, achieving a total of 34 responses (44%), which exceeds the minimum value that Nulty (2008:310) considers “satisfactory”. Using this approach, the researcher was able to obtain an adequate response rate.

5 Liberal conditions can be set when a population size is small. Nulty (2008) applies Dillman’s (2000) formula to provide the best possible scenario. The set conditions include a 10% sampling error, the formulation of a simple yes/no question, and the acceptance of an 80% confidence level.

4.10. DATA PROCESSING

This section will describe the data processing techniques used to collect, edit and compile data for the structured interviews (**Phase 1**), as well as the quantitative analysis of the primary data (collected in **Phase 2**).

4.10.1. Phase 1 – Structured interviews

During the interviews, the researcher penned the answers provided by the dive operator next to each question on the interview sheet (Appendix A). The researcher then transposed the results obtained in the structured interviews into a Microsoft[®] Word[®] document. Once this was done, these results were combined with information from the literature review to assist in the development of the structured survey.

4.10.2. Phase 2 – Structured survey

The online web survey data was captured automatically on Survey Monkey[®] by the respondents. The manual survey data was later captured on Survey Monkey[®] by the researcher. Data processing involved capturing and editing the data once it was received. Once capturing was complete, the data was checked to ensure it was free of inconsistencies. This process, known as data editing, was used to examine all the completed web surveys and manual surveys to identify errors and incompleteness (Kumar, 2005). Once all the data had been checked, it was saved as a .csv file on Microsoft[®] Excel[®] as raw data and sent to a statistician. This enabled the statistician to provide organised, tabulated and presentable data for interpretation and analysis using IBM SPSS[®]. Data analysis is discussed next.

4.11. DATA ANALYSIS

Data analysis is the categorising, ordering, manipulation and summarising of data into an interpretable form so as to test relationships and to be able to draw conclusions (De Vos et al., 2007). The data analysis presented in this section will only discuss the data collected from **Phase 2**, as this was the main component of the research. The analysis of data refers to data types, and includes issues of validity and reliability, which are discussed next.

4.11.1. Data types

In research, different variables in the topic under study are identified for study to ensure that the data collected is focused and useful. Variables can be categorised as categorical of

numerical data. The categorical data the researcher refers to is nominal and ordinal data, while numerical data refers to ratio data (De Vos et al., 2007), as outlined in Figure 4.4. The types of variable relevant to the structured survey are nominal, ordinal and ratio. Table 4.9 provides the types of variable used and their application to the structured survey.

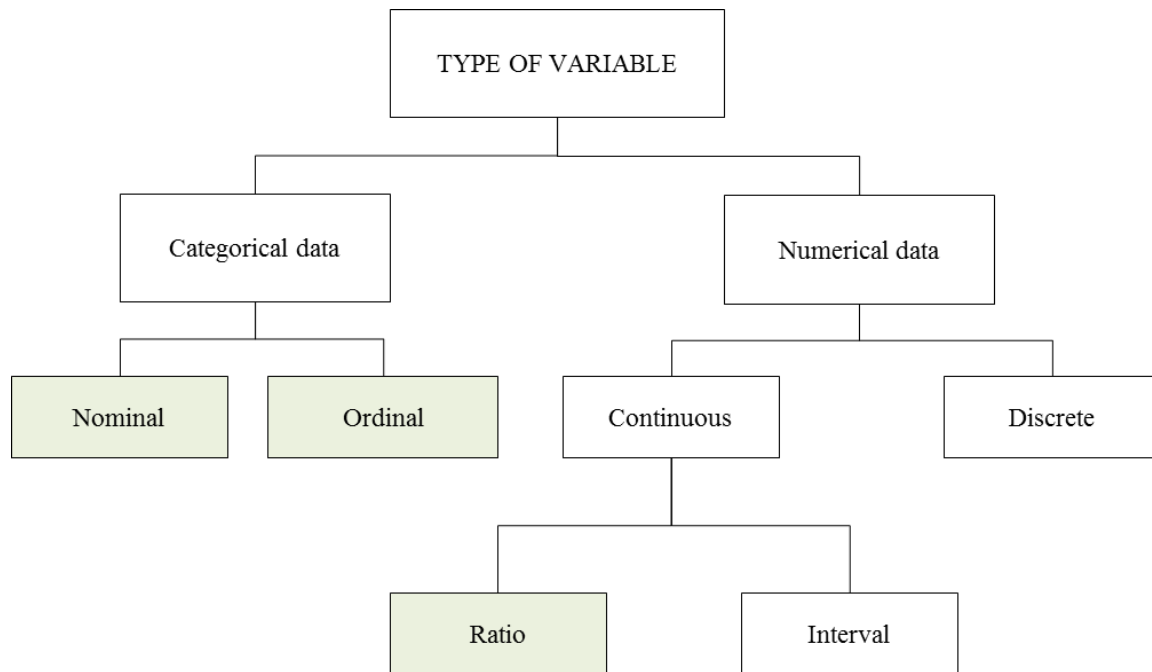


Figure 4.4: Types of variables for data analysis

Source: De Vos et al. (2007).

Table 4.9: Types of variables applied to the structured survey

Type of variable	Description	Method of validation	Application to structured survey
Nominal	Classify into categories	Calculate frequencies	Questions 1, 2, 3, 4, 5, 6, 7, 10, 14, 15, 16, 19, 22,25, 26, 27, 28
Ordinal	Order by rank or magnitude	Calculate frequencies	Questions 12, 13, 17, 18, 20, 21, 23, 24
Ratio	Categories exist on a scale. Distance between values has an absolute zero point	Calculate means, maximum and minimum values	Questions 8, 9, 11

Source: Adapted from Conradie (2010) and De Vos et al. (2007).

The data was checked and cleaned by the statistician to ensure correctness and was prepared for analysis. The validity and reliability of the research instrument will be discussed next.

4.11.2. Validity and reliability

The validity and reliability of the data is discussed under ‘Data analysis’ because of the statistical components that follow. A valid and reliable research instrument leads to

appropriate conclusions from the data with the aim of solving the research problem in a clear, concise and credible way (Leedy and Ormond, 2010). The validation of research results is seen as a strength in both qualitative and quantitative research. Content validity and statistical evidence are two approaches to establishing the validity of a research instrument (Kumar, 2005).

Content validity is an important validation process which tests whether a measurement reflects the specific intended domain of the content (Carmines and Zeller, 1991). Three strategies were used to validate the findings using content validity. First, the validity of the survey has been demonstrated by the fact that the questions originated from the literature, as shown in Table 4.6 and Appendix D. The second content validation technique was a peer review, the aim of which was to provide an external check of the research process. The goal here is for peers to ask hard questions about methods used, meanings, and interpretations (Creswell, 2003). This was achieved by the study being reviewed by the researcher’s supervisors and a statistician. The third strategy entailed the researcher pre-testing the structured survey with four dive operators to ensure valid constructs prior to it being sent out to the dive operators in the EAME (see ‘Section 4.8 Pilot testing’ in). Figure 4.5 describes the steps used for the content and statistical validity of the research instrument.

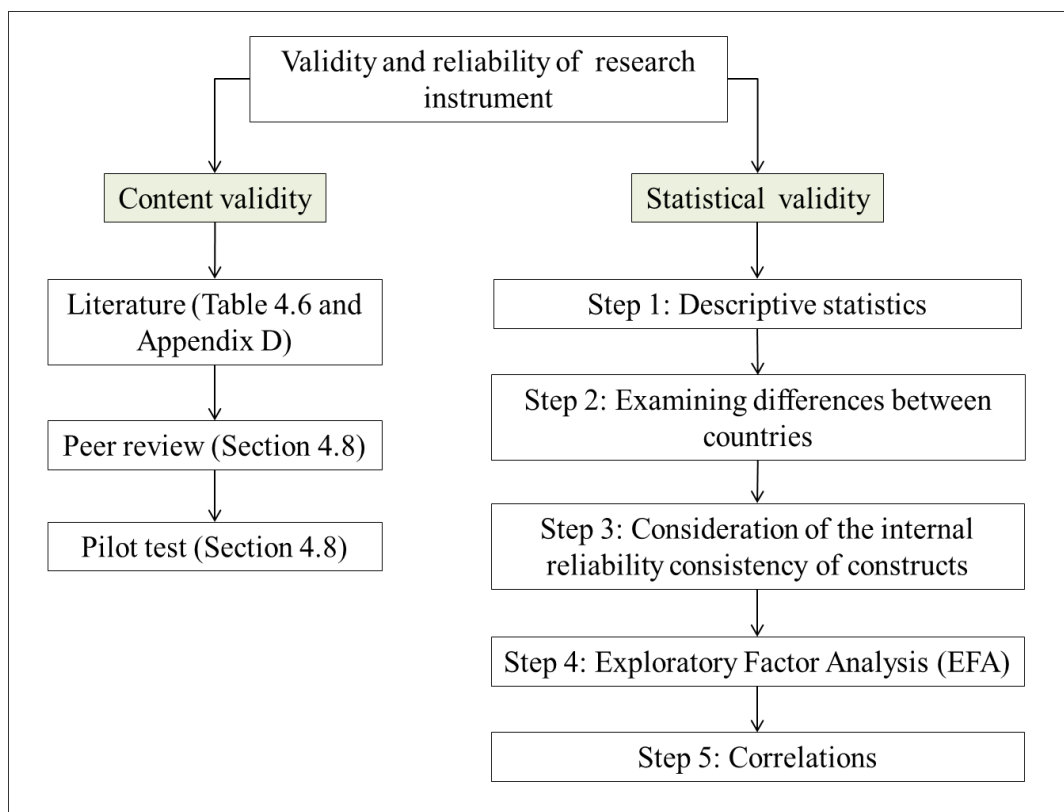


Figure 4.5: Validity and reliability of research instrument

To establish **statistical validity**, the following five steps were applied in order to ensure validity and reliability and, thus, to draw appropriate conclusions from the data:

Step 1: Descriptive statistics (means, standard deviations and frequencies)

Descriptive statistics are used to describe the characteristics of the sample (Leedy and Ormrod, 2010). The presentation of frequencies, measures of location (mean, median and mode) and measures of spread (standard deviation) were used to describe the outcome of this study (Cooper and Schindler, 2008; Collis and Hussey, 2003). As this was also an exploratory study, many of the statistics are descriptive. Accordingly, a descriptive analysis was carried out on all valid data to determine the mean intensity and standard deviation for the responses. The results of the descriptive analysis are presented in the overall results of external risks sections in Chapter 5.

Step 2: Examining differences between countries

Non-parametric tests are often more suitable techniques for smaller samples or when the data collected is measured at the ordinal level (Pallant, 2011). To identify significant differences a Kruskal-Wallis test was run. The Kruskal-Wallis test is a non-parametric test to determine whether three or more independent groups differ (Pallant, 2011). This involved cross-tabulation of questions broken down by country to allow for a comparison of scores between the four countries in East Africa (Pallant, 2011). If the significance level identified is less than 0.05 the researcher may conclude that there is a statistically significant difference in the continuous variables across the different countries (Pallant, 2011). The details of these differences are examined in the cross-case analysis in Chapter 5.

Once this test was confirmed, the mean rank (M) was inspected for the four countries. This indicated which countries had the highest overall ranking corresponding with the highest score of the continuous variables. However, due to the small, sparse and unbalanced sub-samples by country, a specific test technique was employed in addition to the above. This was the Monte Carlo method, which was used to test for significance and statistical problems (Field, 2009).

Step 3: Consideration of the internal reliability consistency of constructs

Cronbach's alpha (α) (convergent reliability). This step in the analysis assessed the internal consistency reliability of the items included in the measurement as indicators of

underlying constructs (Pallant, 2011). In order to assess the internal reliability of the constructs, the Cronbach's alpha statistic was calculated for each construct. The split-half method computes the correlation between the two halves of each construct, with large correlations being a sign of reliability. The average of these values is equivalent to Cronbach's alpha, which is the most common measure of scale reliability (Pallant, 2011). The values are provided in Table 5.6 in Chapter 5.

Inter-item correlations (IICs). The study also investigated the relationships between primary construct measures. According to Pallant (2011), when using short scales (scales with fewer than ten items) it is important to report the mean and inter-item correlation for the items. When selecting scales in a study, it is important to "find scales that are reliable" (Pallant, 2011:97). Accordingly, IICs were used to address a common content area or construct (DeVellis, 2003). In general, a higher value is preferable to a lower value. The values range from 0 to 1, and are considered significant if above 0.30. The IIC results are presented in Table 5.6 in Chapter 5.

Step 4: Exploratory factor analysis (EFA)

Factor analysis is a statistical measure used to describe variability among variables called factors. In EFA, the factors are presented so as to meet certain mathematical considerations without regard to any theoretical correlation (Reinard, 2006). By using this method, it was hoped the factors would correlate within a group of other factors (Field, 2009). Accordingly, the researcher tried to identify factors that would seem to cluster together in a meaningful way. While the Cronbach's alpha (α) values provided evidence and statistical support that the items were indicative (reflective) of a particular set of factors, the researcher aimed to explore the inter-correlation between different factors. The aim was to identify possible factors that were more strongly related than others. EFA is discussed in further detail in Chapter 5.

Step 5: Correlations

One way to test the importance of the difference between groups, to measure whether these differences are statistically significant, is to calculate the effect size (Pallant, 2011). This is also referred to as "strength of association" (Pallant, 2011:210). According to Pallant (2011), for small sample sizes, a variance of 0.1 is considered statistically significant. Kendall's tau (τ) is a non-parametric correlation coefficient test for small sample sizes (Field, 2009). Using

Kendall's tau (τ) test it was possible to estimate the correlation of the population better. The results of the correlation coefficient are discussed in more detail in Section 5.8 of Chapter 5.

4.12. PRESENTATION OF RESEARCH FINDINGS

Having analysed the data, the final step was to present the research findings (Chapter 5). The research findings report what the empirical research revealed. The data analysis is presented according to each risk category (domestic and international) in Part A. The presentation of the overall results is covered in the following sections: biographical information in Section 5.2; and the overall results and ranking of external risks in Sections 5.3 to 5.6. The EFA and correlations between risk categories are discussed in Sections 5.7 and 5.8 respectively. Section 5.9 provides a summary of the overall results and the rankings of external risks. The cross-case analysis is provided in Part B. The presentation of research findings for the cross-case analysis of external risks is provided in Section 5.10. Section 5.11 offers a summary of the cross-case analysis.

4.13. CONCLUSION

The purpose of this chapter was to discuss the research methodology that was applied to determine the findings of the empirical research. The chapter described the steps that the researcher followed in the research process and their application. In **Step 1** the phases of the research were discussed. The primary research consisted of two phases. The purpose of Phase 1 was to gain insights and opinions from dive operators on the external risks most prevalent in the dive tourism industry in the EAME so as to formulate the structured survey in Phase 2. **Step 2** provided a view of the geographical scope of this study on dive operators in the EAME. **Step 3** discussed the research design and **Step 4** introduced the sampling plan. Research ethics was discussed in **Step 5**. The next step (**Step 6**) in the research process was the selection and development of the research instrument. The research instrument for Phase 1 was a structured interview, whereas the instrument selected for Phase 2 was a structured survey in the form of an online web survey. Pilot testing was then discussed in **Step 7**. **Step 8** described the methods employed to collect data for Phases 1 and 2, while **Step 9** described the data processing techniques employed to collect, edit and compile the data obtained during Phase 1 and Phase 2. Data analysis was then discussed in **Step 10**. Only the data from Phase 2 was captured and prepared for analysis. The purpose of this step was to arrange the data in an interpretable form to test relationships and draw conclusions by using various statistical

tests, such as validity (content and statistical) and reliability measures. The values used to determine the results that are presented in this study are available on the accompanying CD (Appendix F). **Step 11** concluded the chapter with a brief overview of how the findings will be presented in Chapters 5 and 6.

CHAPTER 5

ANALYSIS OF DATA AND DISCUSSION OF RESULTS

5.1. INTRODUCTION

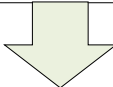
The primary objective of this study was to identify and assess the external risks that may be influencing the sustainability of dive tourism businesses within the East African Marine Ecoregion (EAME). The previous chapter outlined the research design and methodology that was used to achieve the secondary research objectives and, in so doing, achieve the primary research objective. This chapter presents the analysis of the primary data collected: Part A will discuss the overall results and rankings, while Part B will discuss the cross-case analysis. Figure 5.1 illustrates the structure and flow of Chapter 5.

Part A will discuss the biographical information gathered to address the *secondary research objective 1* (Section 5.2). This information includes the number of dive operators in East Africa within the EAME range; the number of years in operation; income derived from scuba diving activities; scuba diving activities that occur on coral reefs; dive operations within or near to marine protected areas (MPAs) and marine reserves; and dive tourists' country of origin. Part A will also present the overall results and ranking for the eight risk categories (DER, IER, DEcR, IEcR, DSR, ISR, DPR and IPR) (Section 5.3) – this will satisfy *secondary research objective 2*. Dive tourist decisions (*secondary research objective 4*) are discussed in Section 5.4.

Sections 5.5, 5.6, 5.7 and 5.8 discuss the risks that have the greatest impact on dive operators, adaptation strategies, exploratory factor analysis (EFA) and correlations between risk categories, respectively. Section 5.9 presents an overall summary of Part A.

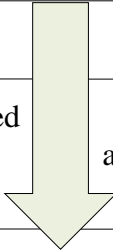
Part B presents a cross-case analysis of external risks in the four countries in the EAME. Section 5.10 will discuss the findings in order to satisfy *secondary research objective 3*. Section 5.11 provides a summary of the cross-case analysis. Section 5.12 concludes the chapter.

5.1 INTRODUCTION



PART A

5.2 BIOGRAPHICAL INFORMATION



5.2.1 Identify dive operators in the EAME

5.2.2 Number of years in operation

5.2.3 Income derived from scuba diving activities

5.2.4 Scuba diving activities that occur on coral reefs

5.2.5 Dive operations within or nearby MPA's

5.2.6 Dive tourists country of origin

5.3 OVERALL RESULTS AND RANKING OF EXTERNAL RISKS

ENVIRONMENTAL RISKS

ECONOMIC RISKS

SOCIAL RISKS

POLITICAL RISKS

5.3.1 DER

5.3.2 IER

5.3.5 DEcR

5.3.6 IEcR

5.3.7 DSR

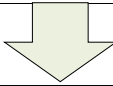
5.3.8 ISR

5.3.9 DPR

5.3.10 IPR

5.3.3 Coral reef degradation occurrence

5.3.4 Coral reef degradation and business continuity



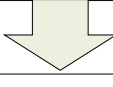
5.4 DIVE TOURIST DECISIONS

5.5 HIGHEST IMPACTS TO DIVE OPERATORS

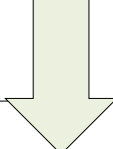
5.6 ADAPTATION STRATEGIES

5.7 EXPLORATORY FACTOR ANALYSIS (EFA)

5.8 CORRELATIONS BETWEEN RISK CATEGORIES

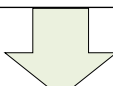


5.9 SUMMARY OF OVERALL RESULTS AND RANKING OF EXTERNAL RISKS



PART B

5.10 CROSS-CASE ANALYSIS OF EXTERNAL RISKS



5.10.1 Direct environmental risks (DER)

5.10.2 Indirect environmental risks (IER)

5.10.3 Domestic economic risks (DEcR)

5.10.4 International economic risks (IEcR)

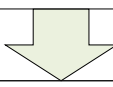
5.10.5 Domestic social risks (DSR)

5.10.6 International social risks (ISR)

5.10.7 Domestic political risks (DPR)

5.10.8 International political risks (IPR)

5.11 SUMMARY OF CROSS-CASE ANALYSIS



5.12 CONCLUSION

Figure 5.1: Structure and flow of Chapter 5

To accompany the structure and flow of Chapter 5, Table 5.1 maps how the data analysis and the discussion of the results links to each of the secondary research objectives of the study. The primary and secondary objectives are listed together with survey questions in the left-hand column and the chapter sections in the right-hand column.

Table 5.1: Mapping of research objectives to the analysis of findings

Primary Research Objective		
Identify and assess the external risks impacting on the scuba diving industry in the East African Marine Ecoregion (EAME).		
Survey questions	Information collected in primary research	Section in chapter
Secondary Research Objective 1		
Identify the SDT operators in the EAME and their scope of operation		
2 to 11	Biographical information:	5.2
	Identify dive operators in the EAME	5.2.1
	Number of years in operation	5.2.2
	Income derived from scuba diving activities	5.2.3
	Scuba diving activities that occur on coral reefs	5.2.4
	Dive operations within or nearby MPAs and marine reserves	5.2.5
	Dive tourists' country of origin	5.2.6
Secondary Research Objective 2		
Identify the external risks most relevant to dive operators in the EAME and to assess their level of impact		
12, 13, 14, 15, 17, 18, 20, 21, 23, 24, 26, 27, 28	Overall results and ranking of external risks	5.3
	Direct environmental risks (DER)	5.3.1
	Indirect environmental risks (IER)	5.3.2
	Coral reef degradation occurrence	5.3.3
	Coral reef degradation and business continuity	5.3.4
	Domestic economic risks (DEcR)	5.3.5
	International economic risks (IEcR)	5.3.6
	Domestic social risks (DSR)	5.3.7
	International social risks (ISR)	5.3.8
	Domestic political risks (DPR)	5.3.9
	International political risks (IPR)	5.3.10
	Highest impacts on dive operators	5.5
	Adaptation strategies	5.6
	Exploratory factor analysis (EFA)	5.7
	Correlations between risk categories	5.8
Summary of overall results and ranking of external risks	5.9	
Secondary Research Objective 3		
Compare individual external risks against each of the countries in the EAME (Kenya, Tanzania, Mozambique and South Africa) using a cross-case analysis		
12, 13, 14, 15, 17, 18, 20, 21, 23, 24	Cross-case analysis of external risks	5.10
	Direct environmental risks (DER)	5.10.1
	Indirect environmental risks (IER)	5.10.2
	Domestic economic risks (DEcR)	5.10.3
	International economic risks (IEcR)	5.10.4
	Domestic social risks (DSR)	5.10.5
	International social risks (ISR)	5.10.6
	Domestic political risks (DPR)	5.10.7
	International political risks (IPR)	5.10.8
	Summary of cross-case analysis	5.11
Secondary Research Objective 4		
Assess the perception of dive operators regarding whether external risks would influence a dive tourist's decision to travel to the dive operator's area of operation in the EAME		
16, 19, 22, 25	Dive tourist decisions	5.4

PART A

5.2. BIOGRAPHICAL INFORMATION

Certain biographical information was collected as part of the data collection process to build a profile of dive operators in the EAME so as to categorise them into groups: by country; by region; by scuba diving income; by years in operation; how much of their diving activities occur on coral reefs; proximity to MPA; and dive tourist origin. The purpose of this was to provide the researcher with information about the dive operators in order to form correlations and make connections between various attributes that were identified in the primary data (see Questions 2–11 of the structured survey in Appendix B).

5.2.1. Dive operators in the EAME

The aim here was to identify the number of dive operators conducting business in the EAME, as well as to categorise their geographical location and distribution along the length of the East African coastline. By doing so, a complete picture could be formed to assist in the interpretation of the primary data. For the purposes of this study, the label ‘dive operator’ refers to all dive operators who are physically located along the east coast of Africa and within the scope of the EAME.

Table 5.2 provides a list of all the dive operators identified along the east coast of Africa who operate within the EAME. These operators are located in specific areas of the coastline where coral reefs are present, and in locations which are characterised as dive tourism hotspots. This list was compiled according to the process explained in Sections 4.5.1 and 4.5.2.

Table 5.2: Dive operators in the EAME by country broken down by region

Dive operators in East Africa		Total number of respondents	
Country	Region	All respondents (n)	Percentage of population
Kenya	Mombasa	3	3.89
	Ukunda and Diani Beach	4	5.19
	Wasini	1	1.30
	Watamu	1	1.30
	Sub-total	9	11.69
Tanzania	Dar es Salaam	1	1.30
	Mafia island	5	6.49
	Mtwara & surrounding areas	1	1.30
	Pemba island	2	2.60
	Tanga & surrounding areas	1	1.30
	Zanzibar island	19	24.67
	Sub-total	30	38.96
Mozambique	Bazaruto islands & Vilanculos	5	6.49
	Inhaca island	1	1.30
	Inhambane	7	9.09
	Memba, Nacala & surrounding areas	3	3.89
	Ponta d'Ouro & Ponta Malongane	4	5.19
	Ponta Mamoli	1	1.30
	Quirimbas Archipelago & Pemba	3	3.89
	Sub-total	24	31.17
South Africa	iSimangaliso Wetland Park – North reef complex	2	2.60
	iSimangaliso Wetland Park – Central reef complex	12	15.58
	Sub-total	14	18.18
Total		77	100

Of the total of 77 dive operators, Tanzania contains the most (30). The highest numbers of these are on Zanzibar Island (19), while five dive operators were found to be on Mafia Island. Mozambique (with 24) has the second most dive operators, with Bazaruto Archipelago and Inhambane, located in central Mozambique, and Ponta do Ouro in southern Mozambique, being considered the prime dive tourism destinations. The premium dive tourism destination in South Africa (with a total of 14 dive operators) is Sodwana Bay, where the majority of the

dive operators are located. Kenya (with 9) has the smallest number of dive operators in East Africa, spread along the coast from Watamu in the north to Wasini in the south.

5.2.2. Number of years in operation

Table 5.3 shows the number of years that dive operators have been in business. Most of the dive operators in East Africa who responded have been in business for more than 20 years, making up ten (29.41%) of the survey responses. The second highest number is between 11 and 15 years, comprising nine (26.47%) of the survey responses. The third highest number of years is between 16 and 20 years, or seven (20.59%) of the survey responses. Collectively, the majority of dive operators that have been in business for ten years or more make up 82.35% of the survey responses. Dive operators that have been operating their dive tourism businesses for between four and six years constituted six (17.64%) of the total survey responses.

Table 5.3: Numbers of years dive operators have been in operation (zero values are excluded)

Number of years in operation	Respondents (n)	Percentage
More than 20 years	10	29.41
Between 16 and 20 years	7	20.59
Between 11 and 15 years	9	26.47
10 years	2	5.88
6 years	2	5.88
5 years	2	5.88
4 years	2	5.88
Total	34	100

5.2.3. Income generated from scuba diving activities

Table 5.4 shows the percentage of income that each dive operator generates from scuba diving activities. The highest values represented from the responses are 100% and 90%. Combined, these two values account for 19 out of 34 responses (55.9%). Ten (29.4%) of the respondents indicated that 100% of their income is generated by scuba diving activities. Results below the 90th percentile may indicate that income is derived from a variety of marine recreational activities, such as snorkelling or other water sports, while some dive operators also include accommodation when considering income generated. Only 14.7% of dive operators generate less than 50% of their income from scuba diving activities.

Table 5.4: Percentage of income generated by scuba diving activities (zero values are excluded)

Percentage of income generated from scuba diving	Response	
	Percentage	Count (n)
100	29.4	10
90	26.5	9
80	8.8	3
70	5.9	2
60	11.8	4
50	2.9	1
30	8.8	3
20	2.9	1
1 to 9	2.9	1
Total	100	34

5.2.4. Scuba diving activities that occur on coral reefs

Figure 5.2 presents the percentage of dive operators' scuba diving activities that occur on coral reefs. The data collected indicated that 25 (73.5%) of the respondents stated that 100% of their scuba diving activities occur on coral reefs. Overall, all or most of the dive operators indicated that their scuba diving activities occurred on coral reefs (between 80 and 100%).

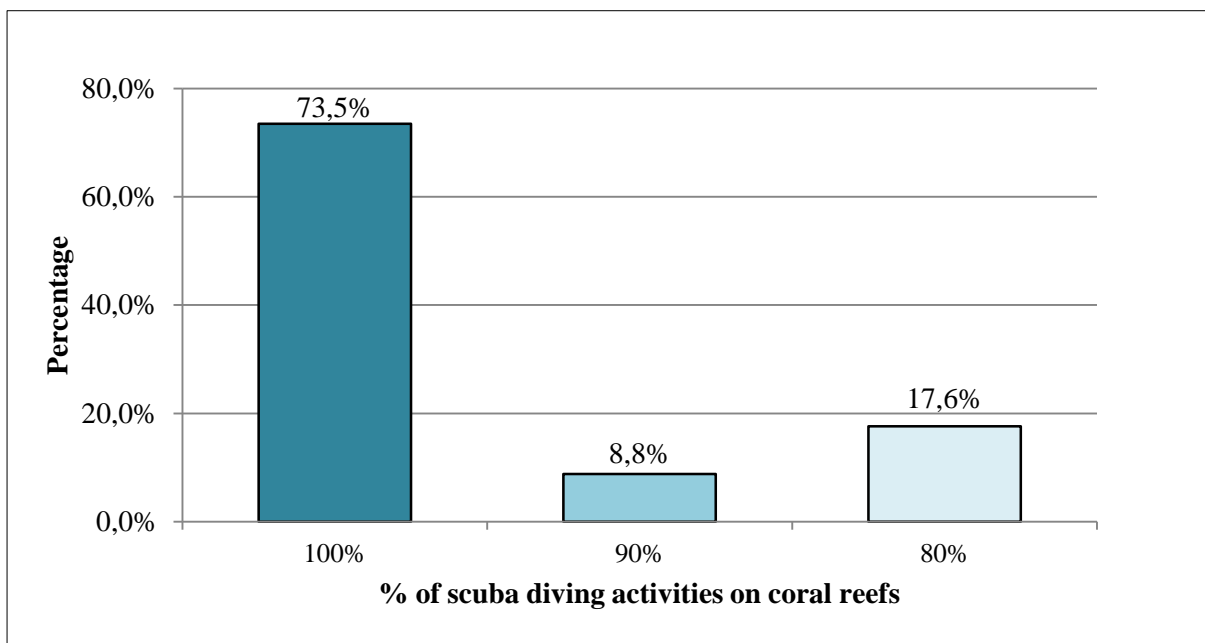


Figure 5.2: Percentage of dive operators' scuba diving activities occurring on coral reefs

Note: Zero values are excluded

The data from the sample size collected does not yield any significant findings that would allow a country comparison to be made; however, there is conclusive evidence to support the findings that all or most scuba diving activities in all four countries occur on coral reefs. Some dive operators take into consideration inland dive sites and wreck dives or dive sites that have features where no coral reefs are present. There are also scuba diving activities where scuba divers are taken out to deep waters to experience deep ocean dives; pelagic fish sightings such as tuna, manta rays and sharks; observations of large seasonal congregations of shoaling fish; and marine mammal sightings, such as dolphins, dugongs and whales. Other dives not related to coral reefs can include training sessions in swimming pools or sand bars which are usually in shallow water or nearby coral reefs.

5.2.5. Dive operations within or near to marine protected areas (MPAs) and marine reserves

The results indicate that all but one dive operator operate within or close to an MPA. MPAs serve as one of the primary attributes of destination image. As discussed in the literature, the key attraction for dive tourists is the availability and access to areas which harbour pristine coral reefs as well as the natural beauty of the surrounding ecosystems. It is the effective management of MPAs and marine reserves that attract dive tourists to the region. MPAs were explained in further detail in Section 3.4.4.3.

5.2.6. Dive tourists' country of origin

Overall, based on the responses, the majority of dive tourists who visit the EAME are from Europe (28.07%). The second highest visitor rate (20.18%) for dive tourists is local divers who travel to dive sites within the borders of their country (domestic tourists) such as South Africans who travel to Sodwana Bay. The third highest number of dive tourists originate from North America (17.54%). This is followed by dive tourists from other parts of Africa (16.67%). This refers predominantly to visitors from South Africa who generally travel to southern Mozambique and Zanzibar in Tanzania. Other regions of the world which travel to East Africa are Australia and New Zealand (Oceania) (7.89%). Asia (3.51%), South America (3.51%) and countries in the Middle East (2.63%) are the least represented.

Table 5.5 presents the origin of dive tourists who travel to the EAME to scuba dive.

Table 5.5: Origin of dive tourists by region

Origin of dive tourists to the EAME	Percentage of sample
Europe	28.07
Local (domestic tourists)	20.18
North America	17.54
Africa	16.67
Oceania	7.89
Asia	3.51
South America	3.51
Middle East	2.63
Total	100.00

5.3. OVERALL RESULTS AND RANKING OF EXTERNAL RISKS

This section will discuss the overall results and ranking of the individual risks per risk category. Descriptive statistics between constructs of external risks are presented and interpreted in graphs and tables in the overall results and ranking sections. Using descriptive analysis, it was possible to make distinctions between significant and insignificant risks. In addition, descriptive techniques were applied to obtain statistics that allowed the researcher to examine the overall variation in the data.

For the data to be reliable, the Cronbach's alpha should be above 0.7 (Pallant, 2011). However, the Cronbach's alpha values were found to be above the minimum suggested threshold value of 0.7 recommended by Pallant (2011). The closer the Cronbach's alpha is to 1, the higher the internal consistency reliability (Sekaran, 2003). If there are fewer than ten items, then it is advisable to consider using inter-item correlation (IIC), which reflects values of significance between 0.2 and 0.4 (Pallant, 2011). The conclusion is therefore that the items can be considered as 'hanging together'. To obtain a single measure for the construct, the average ratings across the set of items were calculated, assuming an equal weight per item. This average therefore provides a proxy measure for the construct and is interpreted in the same manner as that of the original items, namely, lower values close to 1 (indicative of no impact) and values closer to 5 (indicative of a very high impact). The reliability of items therefore meets the criterion of acceptability. These results are presented in Table 5.6.

Table 5.6: Descriptive statistics between external risk constructs

Risk Category (Item)	Cronbach's alpha (α)	Inter-item correlations (IIC)	Meeting minimum acceptable reliability norms
Direct environmental risks (DER)	0.85	0.37	Acceptable
Indirect environmental risks (IER)	0.87	0.48	Acceptable
Domestic economic risks (DEcR)	0.63	0.27	Acceptable
International economic risks (IEcR)	0.83	0.52	Acceptable
Domestic social risks (DSR)	0.86	0.55	Acceptable
International social risks (ISR)	0.71	0.45	Acceptable
Domestic political risks (DPR)	0.76	0.35	Acceptable
International political risks (IPR)	0.66	0.32	Acceptable

Eight risk categories are discussed in the overall results, each of which contains a set of individual risks which are presented using a bar graph. These are ranked from highest to lowest by a mean score. Individual risks with means that fall on or above the moderate impact level ($M = 2.60$) (orange line on graph) are considered to be significant. The overall mean per risk category is presented as the red line. If the individual risk mean falls above the orange line (to the right of 2.60) it is considered significant and will be discussed in more detail in the cross-case analysis in Part B. Since the overall mean (red line) for direct environmental risks (DER) and indirect environmental risks (IER) fall below the orange line (i.e. to the left of 2.60), only the risks above the red line will be considered for further interpretation in the cross-case analysis in Part B.

The individual risk results are accompanied by an overall mean and a standard deviation. The overall mean is represented by M , while the standard deviation is represented by SD . The overall mean is the average number in a set of data (i.e. the average sum of all the responses for overfishing) (Field, 2009; Pallant, 2011). The standard deviation is the measure of spread of the numbers in a set of data from its mean value (i.e. the amount of variation or dispersion of a set of data values) (Field, 2009; Pallant, 2011).

5.3.1. Direct environmental risks (DER)

The sample results indicate that overfishing ranked higher than any other direct environmental risk present in the EAME ($M = 2.88$) ($SD = 1.59$). Marine pollution: floating marine debris such as plastics and fishing gear debris, also featured highly ($M = 2.79$) ($SD = 1.008$), followed by destructive fishing ($M = 2.62$) ($SD = 1.724$). Tourism overuse (coastal development) ($M = 2.24$) ($SD = 1.017$) and diver impacts ($M = 2.15$) ($SD = 0.702$) were

ranked fourth and fifth respectively. Sedimentation, extraction of coral fauna and flora, marine pollution (industrial and municipal wastewater discharge), eutrophication, and coral mining were, however, found to be under the overall mean ($M = 2.15$). Figure 5.3 illustrates the overall ranking of direct environmental risks.

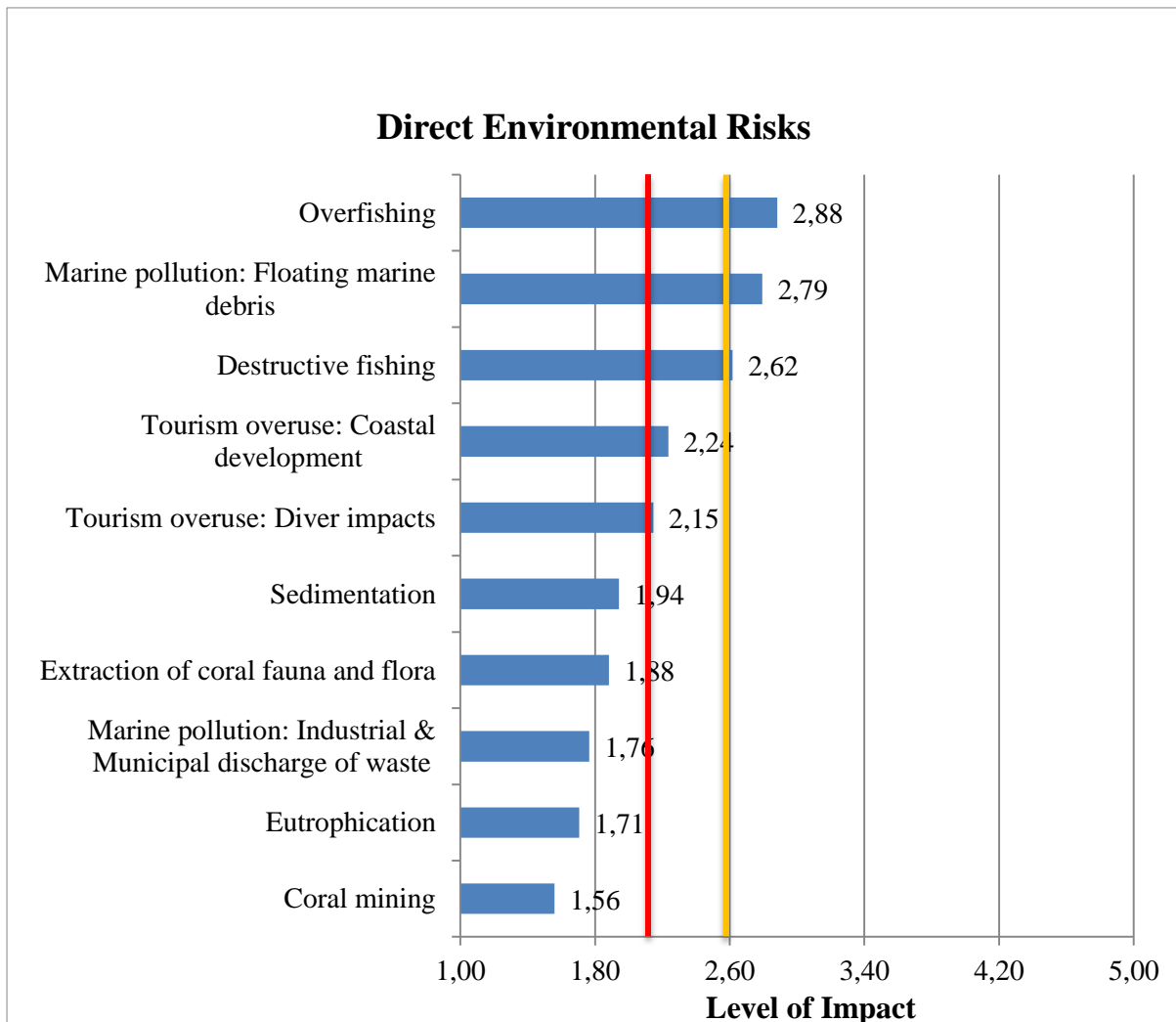


Figure 5.3: Overall ranking of direct environmental risks

[Red line: Overall mean for direct environmental risks ($M = 2.15$) ($SD = 0.76$)]

[Orange line: Moderate impact line ($M = 2.61$)]

As the overall mean for direct environmental risks (DER) falls below the moderate impact, all individual risks that occur on or above the overall mean (red line) will be discussed in more detail in the cross-case analysis (as mentioned in the introduction to Section 5.3). These individual risks are overfishing; marine pollution: floating marine debris; destructive fishing; tourism overuse: coastal development; and tourism overuse: diver impacts.

5.3.2. Indirect environmental risks (IER)

The overall mean distribution for indirect environmental risks (IER) was the lowest of all risk categories ($M = 2.02$). However, the data still provides some valuable insights. Figure 5.4 shows the overall results and ranking of indirect environmental risks. Marine pollution in the form of floating plastic, marine debris and discarded nets from fishing vessels ranks as the highest ($M = 2.56$) ($SD = 0.894$). Coral bleaching ranked second highest ($M = 2.50$) ($SD = 1.11$). Extreme weather events was ranked third ($M = 2.06$) ($SD = 1.01$). However, ocean acidification ($M = 1.94$) ($SD = 0.92$), increased shipping and boating ($M = 1.74$) ($SD = 0.89$), industrialisation of coastal regions ($M = 1.68$) ($SD = 0.91$) and sea level rise ($M = 1.65$) ($SD = 0.95$) all scored below the scale mean.

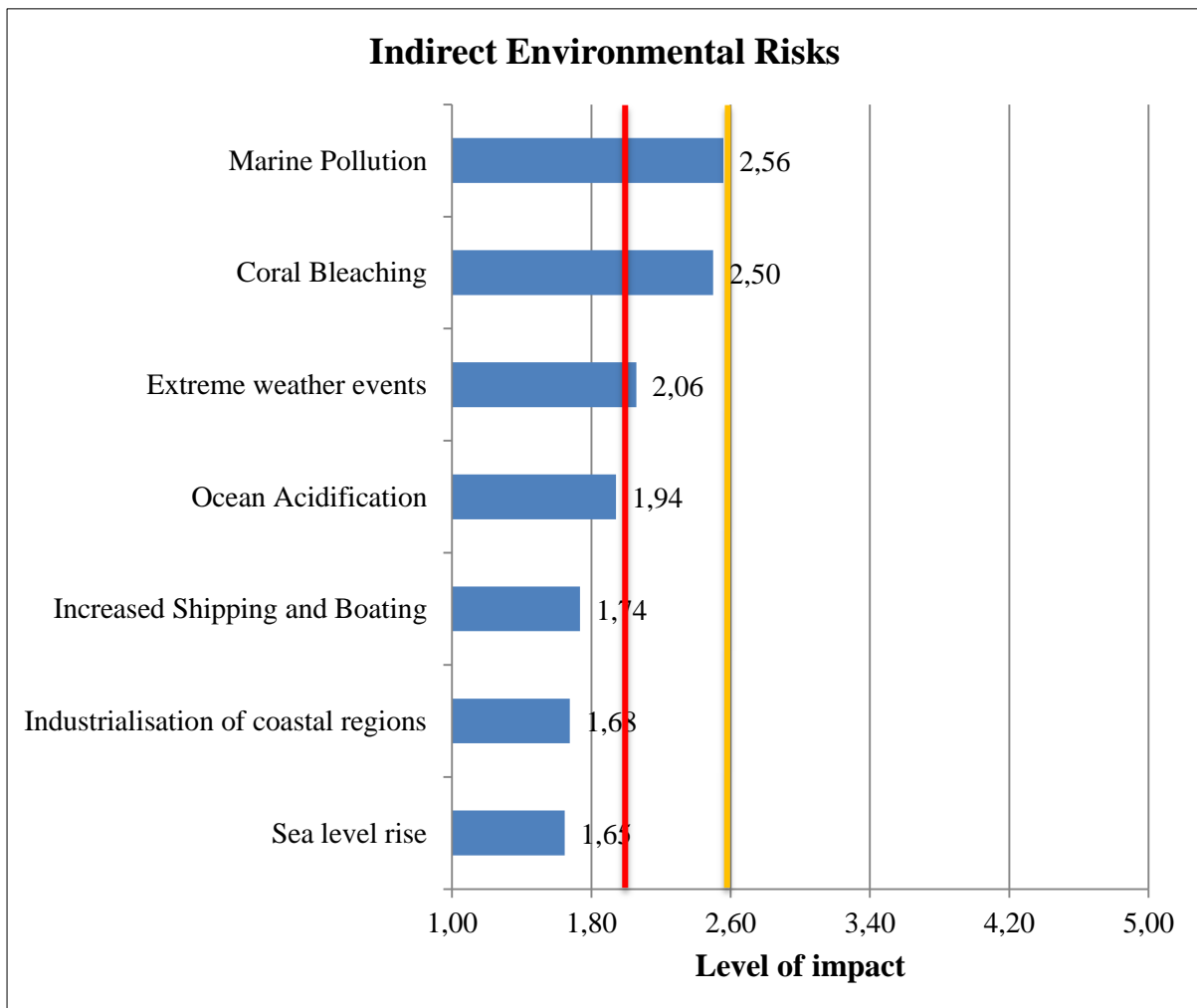


Figure 5.4: Ranking for indirect environmental risks

[Red line: Overall mean for indirect environmental risks ($M = 2.02$) ($SD = 0.71$)]

[Orange line: Moderate impact line ($M = 2.61$)]

As the overall mean for indirect environmental risks (IER) falls below the moderate impact level, all individual risks that occur on or above the overall mean (red line) will be discussed in more detail in the cross-case analysis. Therefore, the findings for ocean acidification, increased shipping and boating, industrialisation of coastal regions and sea level rise will not be considered for discussion in the cross-case analysis.

5.3.3. Coral reef degradation occurrence

Dive operators were asked to give their opinion on whether they felt coral reef degradation would continue in their area of operation. A key finding was that none of the respondents reported that coral reef degradation would decrease over time. This acknowledgement shows that dive operators perceive that coral reef degradation will either continue with the same frequency, or continue to get worse. Fifty per cent of the respondents expressed concern that coral reef degradation would occur more often, while 35.3% said that it is likely to happen at the same pace. In addition, 14.7% of the respondents were unsure whether coral reef degradation would continue to worsen or continue at the same pace. Table 5.7 shows the results of the perceived future occurrence of coral reef degradation by dive operators.

Table 5.7: Coral reef degradation occurrence

Decrease over time	Continue at the same frequency	Occur more often	Not sure	Total
0.0%	35.3%	50.0%	14.7%	100%

5.3.4. Coral reef degradation and business continuity

Dive operators were asked whether coral reef degradation would have an impact on their businesses, and how long they could continue to operate given the extent of coral reef degradation. In response, 11.35% of the respondents felt that they would close their operations within five years, while 14.65% said their businesses could survive if there were no further coral reef degradation. The largest percentage of respondents (39.28%) said that they could continue to operate indefinitely. The second highest response was by those respondents who were unsure whether continued coral reef degradation would affect the dive businesses. No respondents felt that they needed to close their business immediately or close within a year. Table 5.8 presents these findings.

Table 5.8: Coral reef degradation and business continuity

Unsustainable: Close business immediately	Close business in a year	Close business in 5 years	Can continue to operate indefinitely	Can survive if there is no more coral reef degradation	Not sure	Total
0	0	11.35%	39.28%	14.65%	34.75%	100%

5.3.5. Direct economic risks (DEcR)

The overall mean for domestic economic risks was 3.24. This indicates a moderate to high risk according to the five-point Likert scale. Price inflation ranked the highest ($M = 3.94$) ($SD = 0.983$). Depressed local economic activity ($M = 3.53$) ($SD = 1.354$) was second highest and high fuel prices ($M = 3.44$) ($SD = 1.133$) ranked third highest. Increasing interest rates ($M = 3.12$) ($SD = 1.452$) and economic impact resulting from coral reef degradation ($M = 2.15$) ($SD = 1.158$) fell below the average mean, at fourth and fifth, respectively. Figure 5.5 shows the ranking for domestic economic risks.

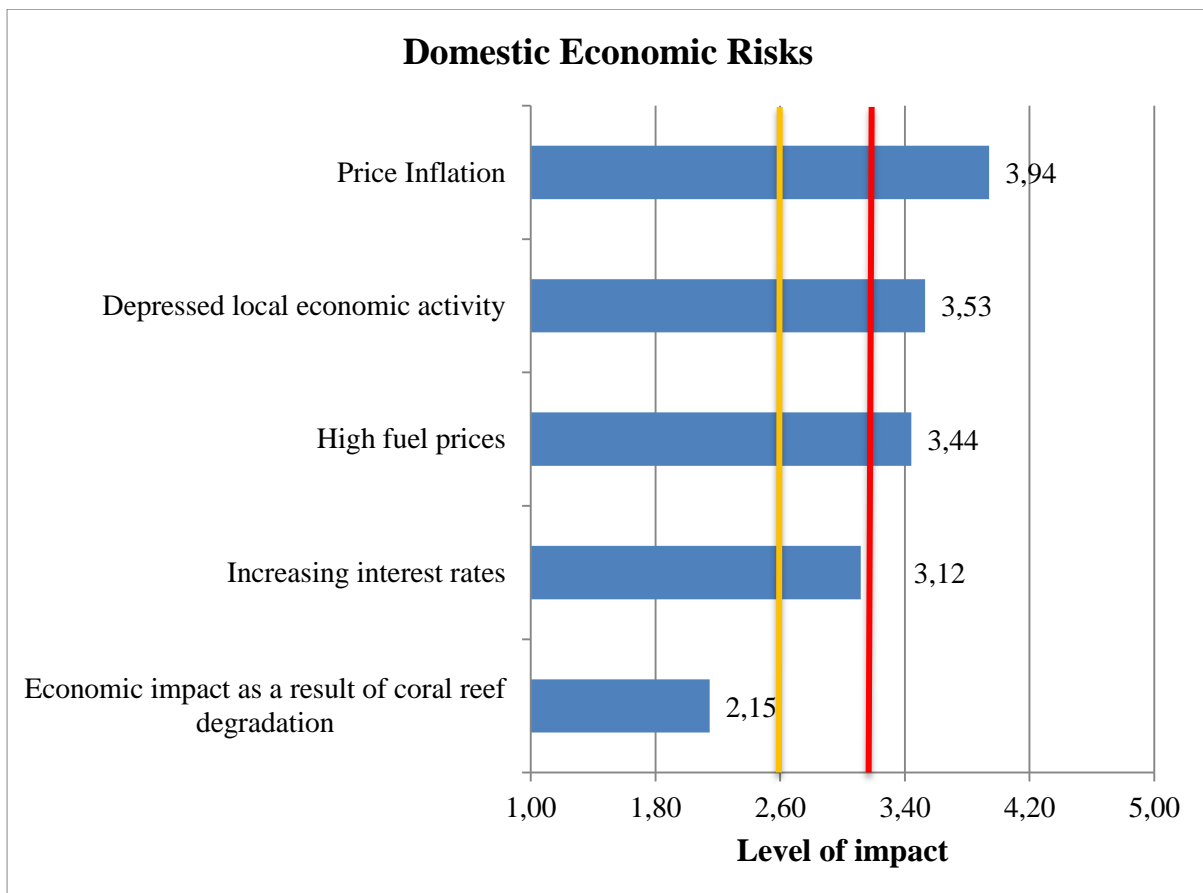


Figure 5.5: Ranking for domestic economic risks

[Red line: Overall mean for direct economic risks ($M = 3.24$) ($SD = 0.78$)]

[Orange line: Moderate impact line ($M = 2.61$)]

5.3.6. International economic risks (IEcR)

International economic risks ($M = 3.34$) ranked the highest among all risk categories. Respondents felt that on average, international economic recessions ($M = 3.62$) ($SD = 1.045$) have the greatest impact on dive operators' businesses. Events such as a slowdown in global economic activity were provided as an example in the survey. Financial crises ($M = 3.47$) ($SD = 1.107$) were ranked second highest, with references to the 2008 financial crisis, stock market collapses and Brexit. Dive tourist accessibility ($M = 3.32$) ($SD = 1.532$) was ranked third, citing limited access to dive locations, increasing travel and accommodation costs and poor road conditions. Price competitiveness ($M = 3.29$) ($SD = 1.268$) and high exchange rates ($M = 3.00$) ($SD = 0.985$) were considered on average a moderate risk, according to responses recorded by the five-point Likert scale. Figure 5.6 shows the ranking for international economic risks.

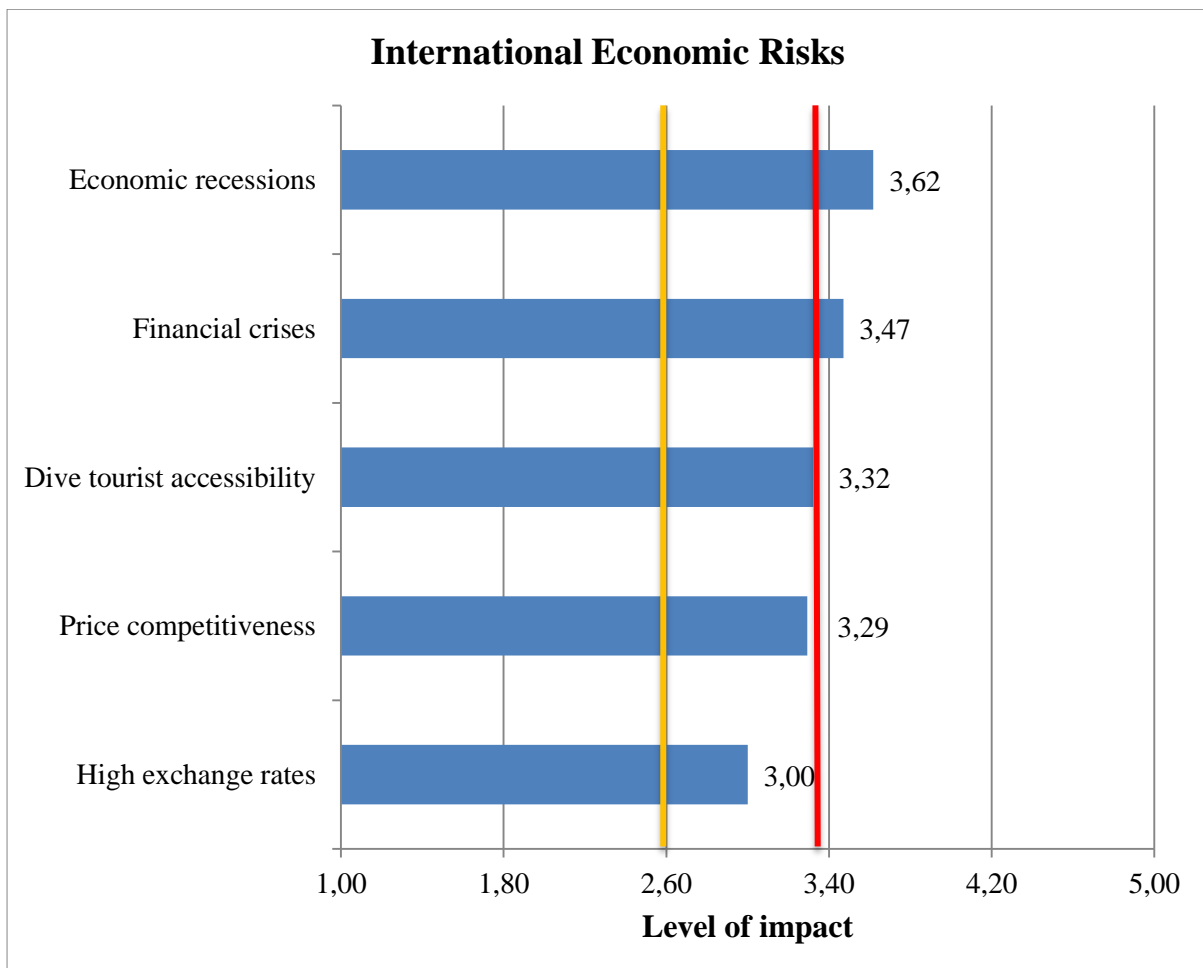


Figure 5.6: Ranking for international economic risks

[Red line: Overall mean for international social risks ($M = 3.34$) ($SD = 0.92$)]

[Orange line: Moderate impact line ($M = 2.61$)]

5.3.7. Domestic social risks (DSR)

Dive operators responded that local or domestic crime ($M = 3.03$) ($SD = 1.446$) is the risk that has the greatest impact on their businesses. They also consider population growth along the coastal regions ($M = 2.91$) ($SD = 1.443$) to have an impact, as well as rising unemployment ($M = 2.85$) ($SD = 1.306$). Increased dependency on marine resources by communities ($M = 2.62$) ($SD = 1.208$), leading to the degradation of coral biodiversity was considered a low to moderate risk. Local health and disease epidemics such as malaria, HIV/AIDS, food and water-borne diseases were also perceived be a low to moderate risk. Figure 5.7 shows the ranking for domestic social risks.

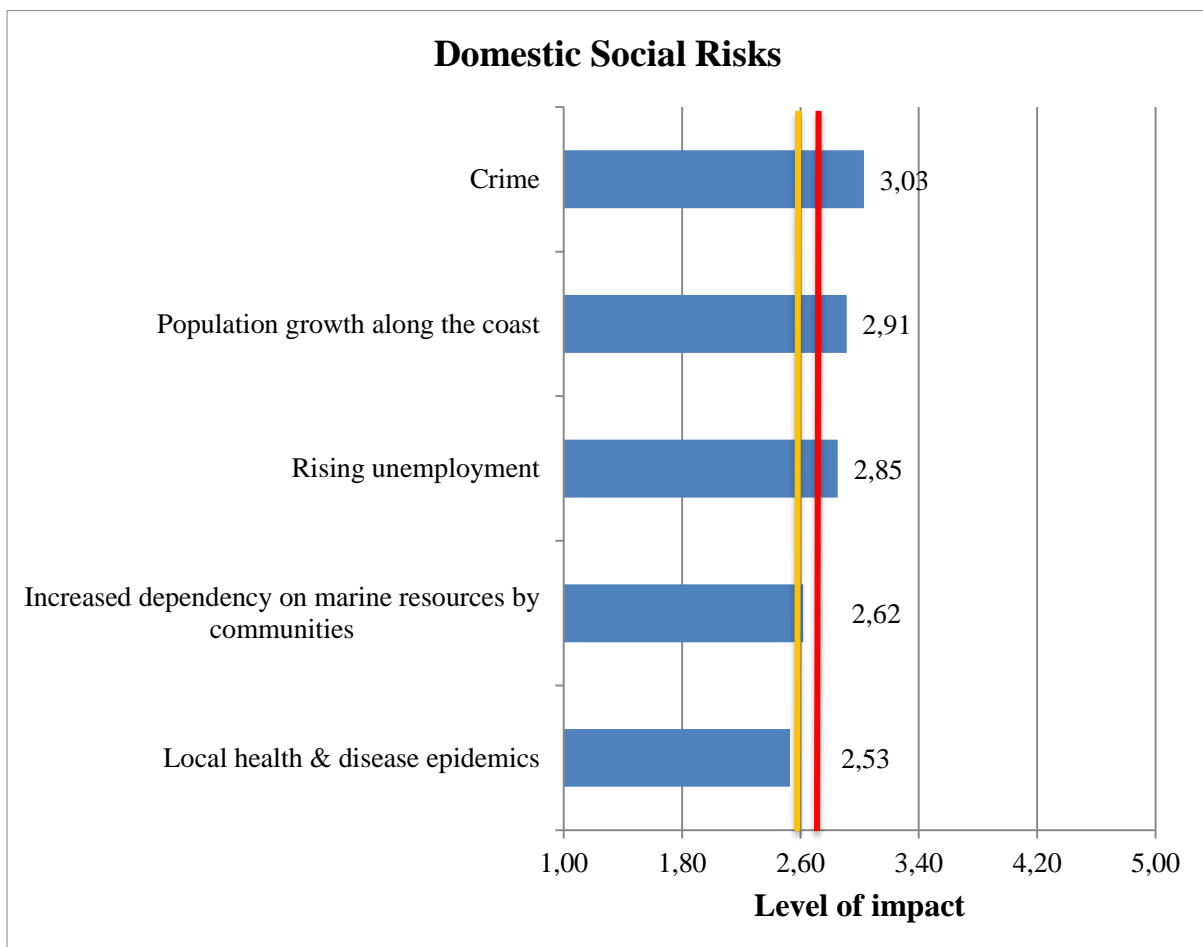


Figure 5.7: Ranking for domestic social risks

[Red line: Overall mean for domestic social risks ($M = 2.79$) ($SD = 1.05$)]

[Orange line: Moderate impact line ($M = 2.61$)]

5.3.8. International social risks (ISR)

Global disease epidemics ($M = 3.24$) ($SD = 1.30$) such as Ebola, cholera and the Zika virus have, on average, a significant impact on dive operators' businesses, while international

crime (terrorism, piracy, drug and human trafficking) ($M = 3.21$) ($SD = 1.452$) seems to have a moderate impact overall. Respondents reported coastal migration from neighbouring countries ($M = 2.18$) ($SD = 1.336$) as having a low impact. Figure 5.8 shows the international social risks in order from highest to lowest impact.

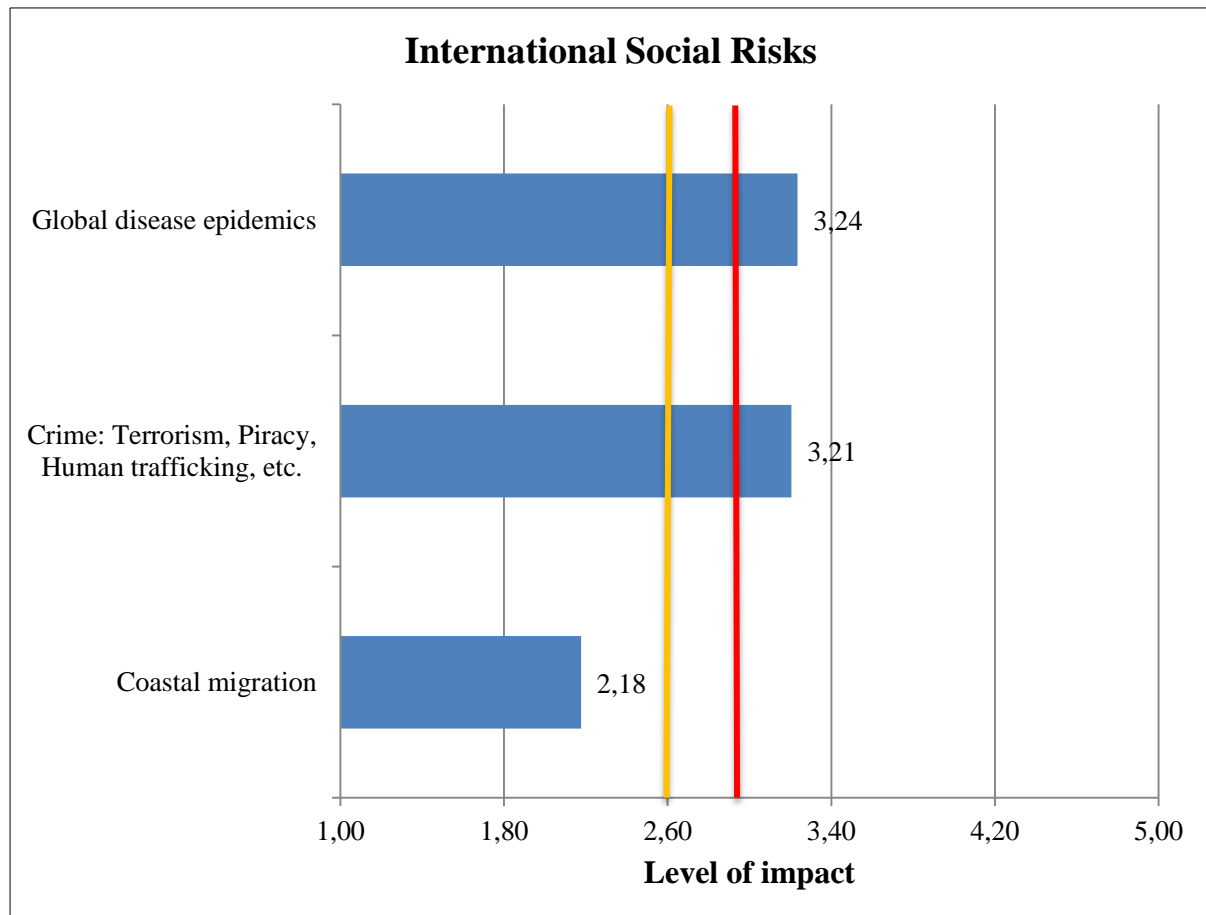


Figure 5.8: Ranking for international social risks

[Red line indicates the overall mean for international social risks ($M = 2.87$) ($SD = 1.08$)]

[Orange line: Moderate impact line ($M = 2.61$)]

5.3.9. Domestic political risks (DPR)

Figure 5.9 shows the overall ranking of domestic political risks, with political instability ($M = 3.85$) ($SD = 1.158$) ranking as the highest such risk and most of the dive operators rating it as having a high to very high impact. Restrictive government regulations ($M = 3.56$) ($SD = 1.284$) were similarly rated by many of the dive operators, as was the lack of service delivery ($M = 3.53$) ($SD = 1.331$). Government corruption ($M = 3.24$) ($SD = 1.558$) was viewed as a moderate to high risk, while restrictive MPA regulations ($M = 2.74$) ($SD = 1.657$) and lack of MPA regulations ($M = 2.47$) ($SD = 1.502$) scored a low to moderate level of impact, well below the overall mean.

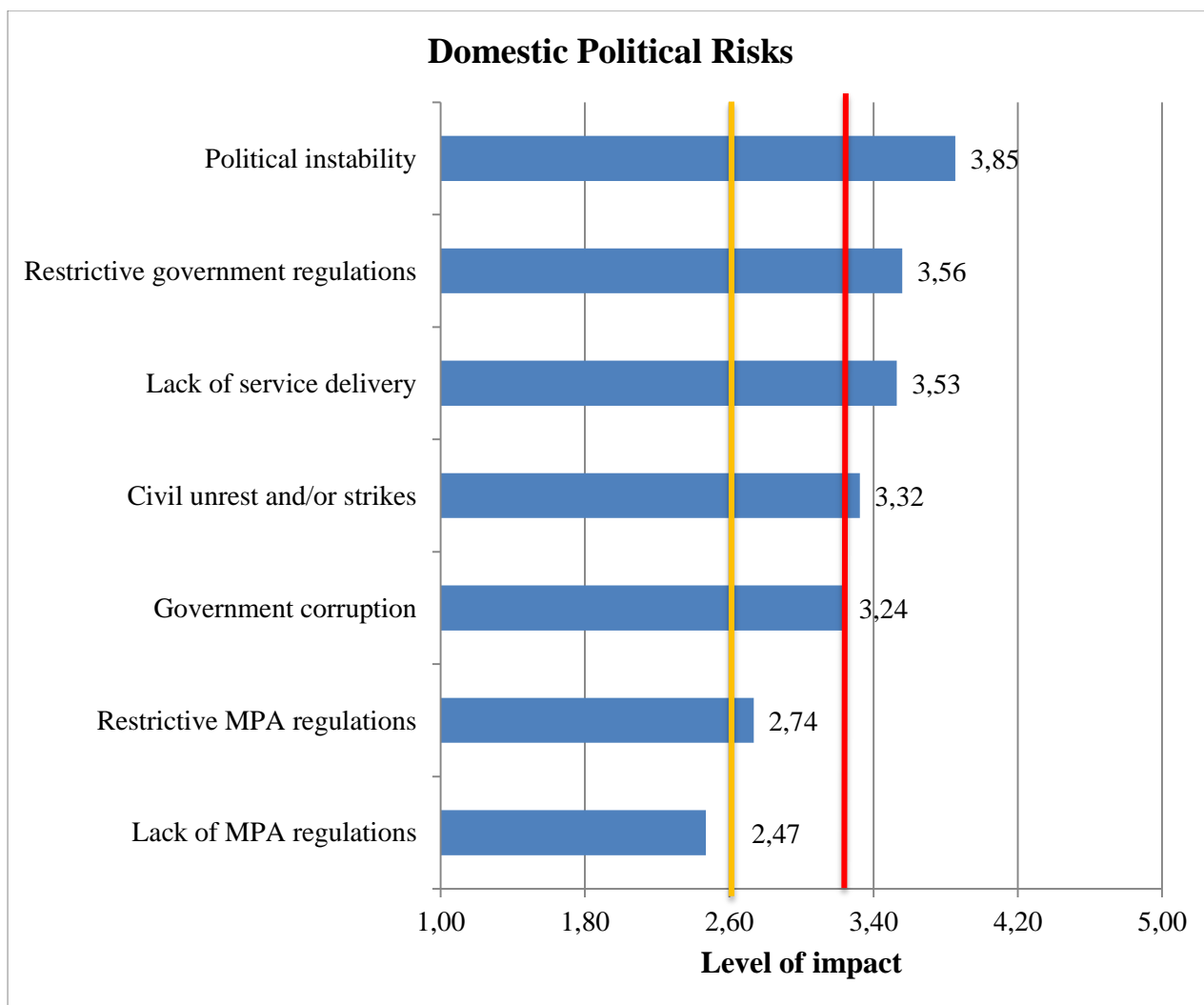


Figure 5.9: Ranking for domestic political risks

[Red line: Overall mean for domestic political social risks (M = 3.24) (SD = 0.89)]

[Orange line: Moderate impact line (M = 2.61)]

5.3.10. International political risks (IPR)

Strict visa regulations (M = 3.68) (SD = 1.173) result in dive tourists experiencing difficulties in travelling to countries in the EAME, owing to the need to obtain visas, or complexities around specific travel document requirements (such as the recent requirement for unabridged birth certificates for entry by minors into South Africa in 2015), and are considered to have a high to very high impact by most dive operators. Travel restrictions (M = 3.50) (SD = 1.542) (which are published by government organisations) warning travellers about possible safety and security threats in the region or country of intended travel are also seen to have a high to very high impact on dive tourism businesses in the EAME. Regional political instability (M = 2.88) (SD = 1.175), on the other hand, is perceived to have a moderate impact, whereas

neighbouring conflicts ($M = 2.65$) ($SD = 1.390$) are considered to have a low to moderate impact. Figure 5.10 shows these results and ranking.

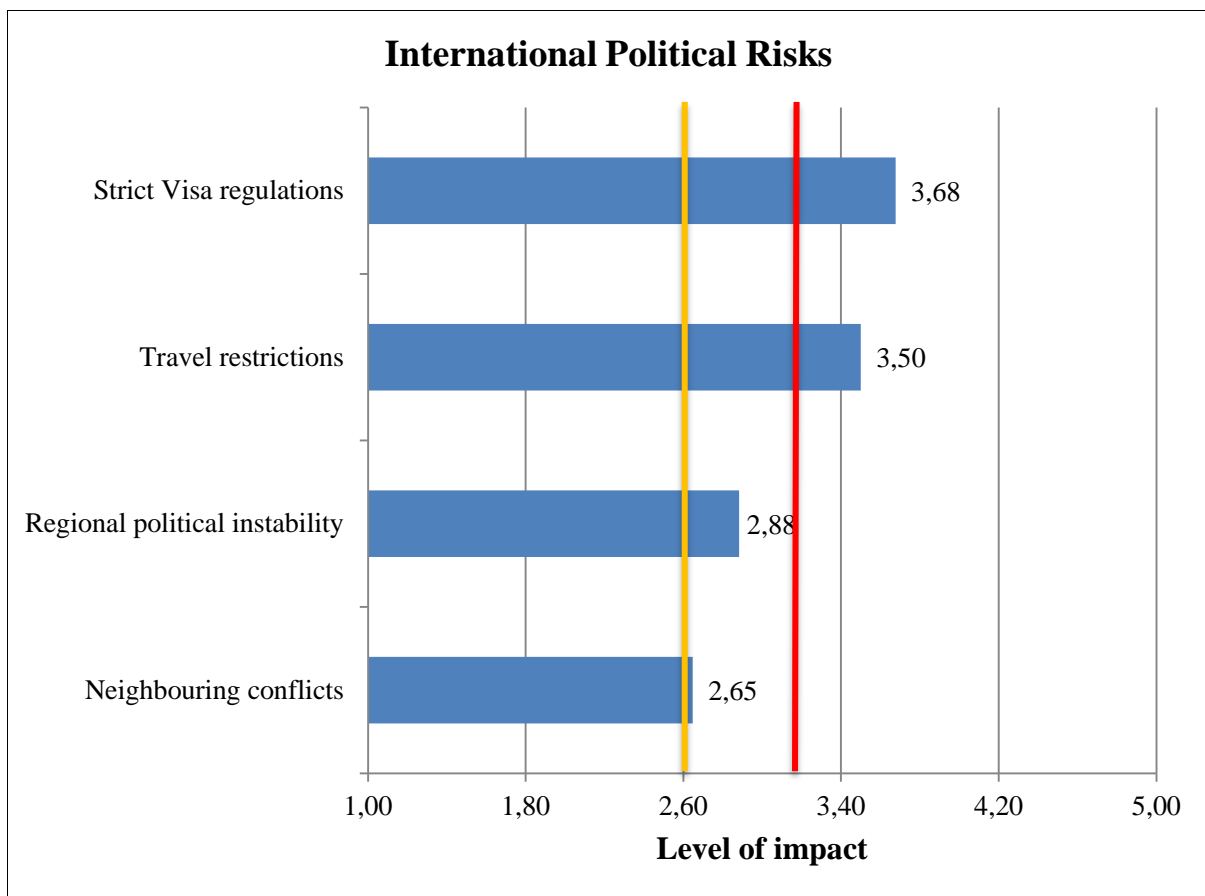


Figure 5.10: Ranking for international political risks

[Red line indicates the overall mean for domestic political risks ($M = 3.24$) ($SD = 0.94$)]

[Orange line: Moderate impact line ($M = 2.61$)]

5.4. DIVE TOURIST DECISIONS

This section describes the results for Secondary Research Objective 4, which is to assess the perception of dive operators regarding whether external risks would influence a dive tourist's decision to travel to the dive operator's area of operation in the EAME. The question was asked for each risk category and is indicated at the top of Figure 5.11. While this question was about the supply side of dive tourism, and is based on a dive operator's perception, it is expected that dive operators have an in-depth understanding of the risks that could influence dive tourists' decisions on whether or not to travel to the former's place of business to scuba dive. Such reasons may include that they are informed by the dive tourist that a certain external risk may prevent them from travelling to the dive destination, or that, as certain events occur, past experience tells the dive operator that forthcoming dive tourist numbers

may decrease. The results indicate that dive operators perceived all risk categories as having an influence on whether a dive tourist would travel to a dive destination.

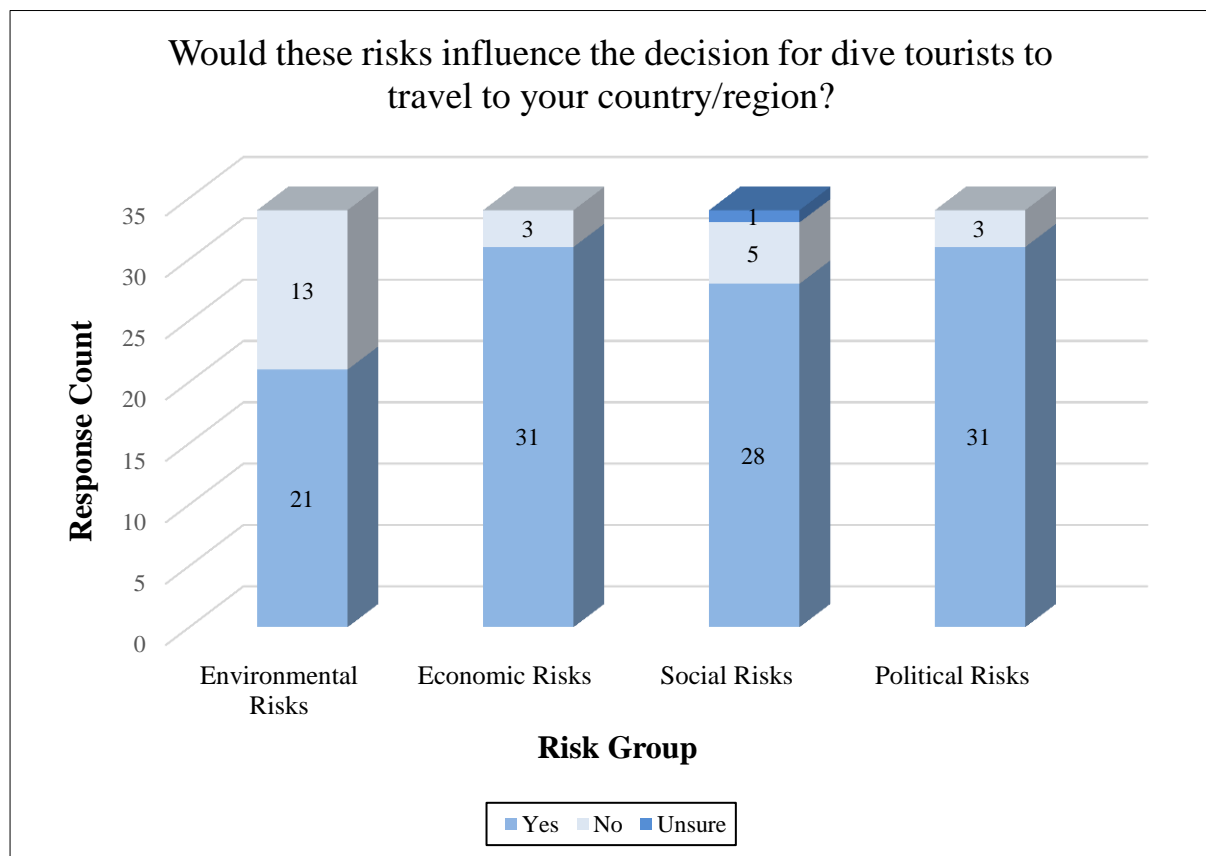


Figure 5.11: Influence of external risk categories on a dive tourist’s decision to travel to a dive destination

The dive operators surveyed reported a high probability that if the following overall risks occurred, dive tourists would not travel to the dive destination.

- Economic risks (91.12%) and political risks (91.12%) scored highest with 31 out of 34 responses.
- Social risks were also considered high as 28 (82.35%) of the respondents felt it was too risky for dive tourists. Only one dive operator was unsure of whether a social risk was a threat to their business.
- Twenty-one (61.77%) felt that environmental risks were a concern for dive tourists.

Although these findings are not in depth or conclusive, and there may be many reasons why dive tourists would not travel to a dive destination, this finding does indicate that external risks can influence a dive tourist’s decision to travel to a dive destination, thereby impacting on a dive operator’s business.

5.5. GREATEST IMPACTS ON DIVE OPERATORS

The questions in this section aimed to obtain the dive operators' overall view of the risk categories that they perceive will have the biggest impact on dive operators' businesses in the EAME, both currently and in the future. Of the four risk categories, they were asked to select one option only.

5.5.1. Highest risk categories currently

Respondents were asked which risk category currently has the biggest impact on their dive operation. Overall, dive operators felt that political risks (50%) have the greatest impact on their dive operation at present, followed by economic risks (35.3%). Environmental risks (8.8%) and social risks (5.9%) were not deemed to have a high impact on dive operator businesses currently. Figure 5.12 shows these results.

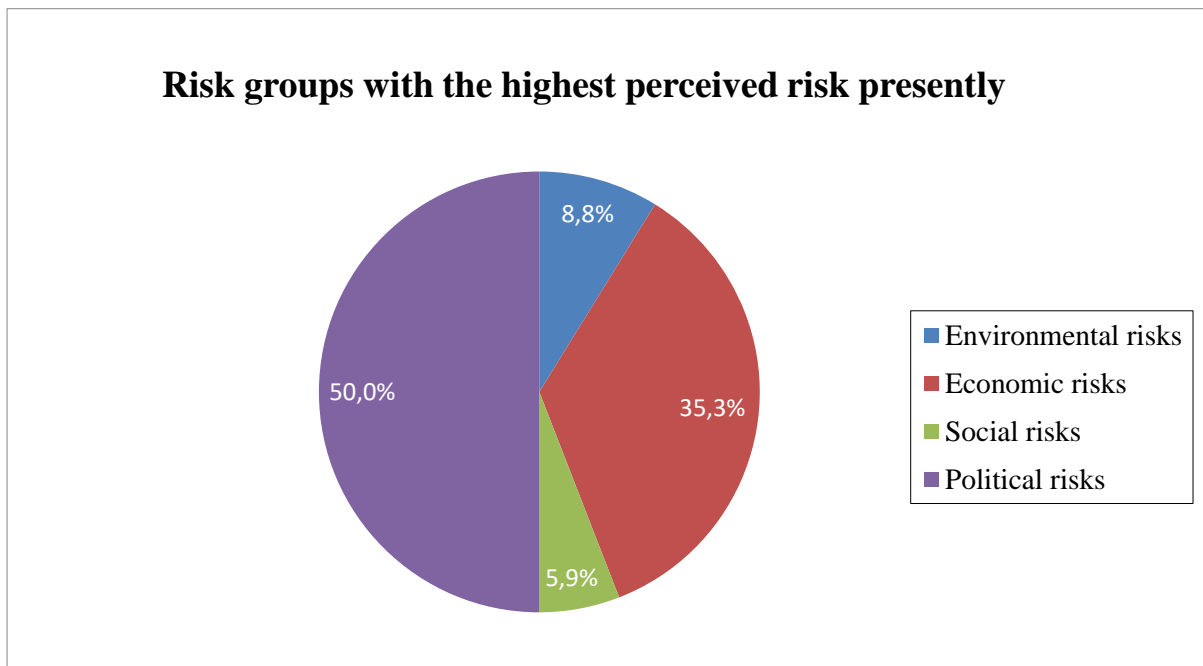


Figure 5.12: Risk groups perceived to currently have the highest impact on a dive operator business

5.5.2. Highest risk categories in future

Similarly, dive operators were asked to assess which of the four risk groups they perceived would have the greatest impact on their business in future. In this case, the results change dramatically, as political risks (41.2%) and economic risks (29.4%) decrease in perceived impact by 8.8% and 5.9%, respectively. However, environmental risks rise to 26.5%, an increase of 17.7% from the present state. This is an important finding as environmental

impacts, as discussed in Chapter 3, are expected to have a significant effect on dive tourism businesses in future. Figure 5.13 indicates these results.

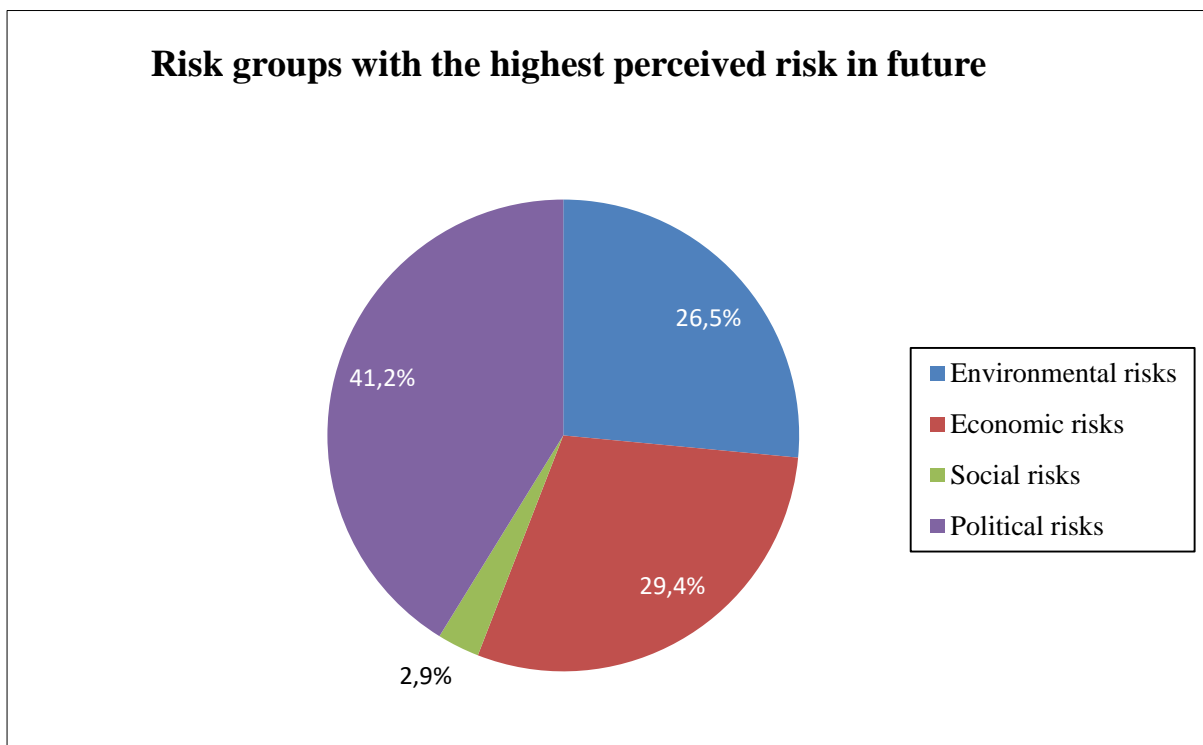


Figure 5.13: Risk groups perceived to have the greatest impact on a dive operator business in future

5.6. ADAPTATION STRATEGIES

The final question of the web survey was to assess whether dive operators had applied adaptation strategies to mitigate any external risks they see to be impacting on their businesses. The results conclude that the majority of respondents have not applied any adaptation measures to mitigate their external risks. This finding is expressed as the pie chart in Figure 5.14.

It is concerning to note that a large number of dive operators indicated that they had not identified any risk mitigation measures to prevent these external risks from impacting on their businesses (29.4%). However, a number of operators indicated that they had implemented certain strategies to mitigate some of the risks (26.5%). Of the respondents, 20.6% felt that although they had contemplated adaptation strategies they had not implemented any, while 11.8% said they had not considered any mitigation measures that might counter external risks. Essentially, only 38% of respondents felt they had any means of effectively mitigating external risks.

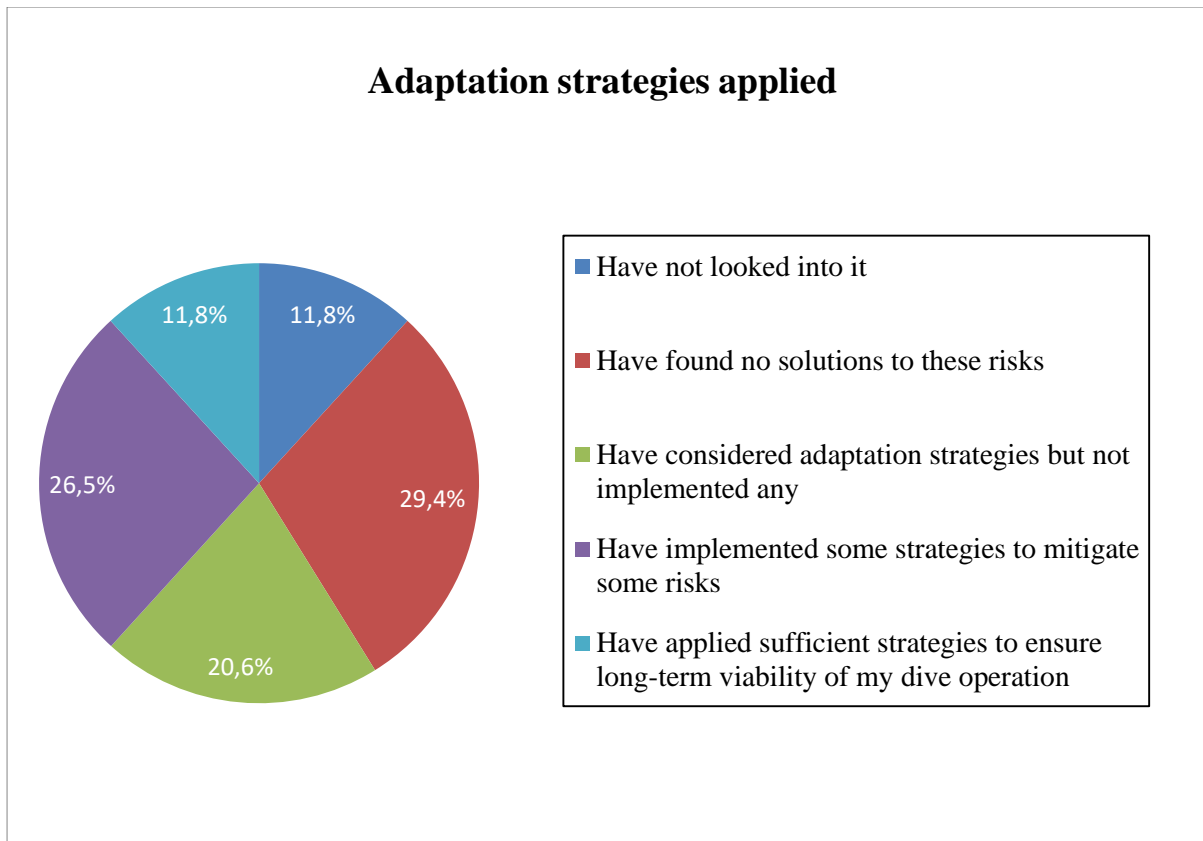


Figure 5.14: Adaptation strategies applied to mitigate external risks

Regarding ensuring the long-term viability of their dive operations, only 11.8% of the dive operators responded by saying that they had applied adequate strategies. This finding is important, as the majority of those who operate dive tourism businesses in the EAME feel that they do not have the ability to counteract the effects of the domestic and global events that frequently transpire and are a risk to their businesses.

A study by Sealey-Baker (2010) found that if dive operators in the Caribbean were to implement adaptation measures, their dive tourism businesses would be viable for 26 or more years, but these businesses would cease to be feasible in six to ten years if no action were taken. Given the longevity of dive operators in the EAME, it would seem that they have not been particularly affected by external risks in the past, but are currently more prone to the effects of domestic and international risks, as indicated in the results in Sections 5.3, 5.4 and 5.5. In addition, as the findings of this research suggest (Section 5.5.2), dive operators feel that more risks will have an impact on their businesses in future (i.e. environmental risks are expected to be more of a concern).

5.7. EXPLORATORY FACTOR ANALYSIS (EFA)

Respondents were asked to reflect their views on external risks to test whether they have an impact on dive operators' businesses in the EAME. While the analysis indicated that the combination of items provides an acceptable measure of the overarching factors being investigated (i.e. direct environmental risks, etc.), exploratory analysis was also used to identify any other possible sub-factors that might offer further insight into the research aims/questions.

Accordingly, the data for external risks was subjected to exploratory factor analysis (EFA). The aim was to investigate the underlying structures and whether they could be simplified into one or more factors. Hence, EFA was employed to explore and identify any meaningful dimensions emerging from the data and was performed on the 46 questions in Sections 12, 13, 17, 18, 20, 21, 23 and 24 of the structured survey (variables of interest). The relationships among these variables were measured using a five-point Likert scale to rate the impact of external risks. Table 5.9 provides a list of the sub-factors and items identified as a result of the EFA.

Table 5.9: Factors identified by exploratory factor analysis (EFA)

Factor	Original number of items (N)	Number of underlying sub-factors identified	% variation explained	KMO > 0,8 & Bartlett's test of sphericity < 0,05	Sub-factors and items identified
Direct environmental risks (DER)	10	3	61.3	Yes	Fish population reduction (Items 3, 4 & 9) Coastal urbanisation (Items 2, 5, 7 & 8) Overuse (Items 1 & 6)
Indirect environmental risks (IER)	7	2	65.9	Yes	Indirect environmental degradation (Items 1, 2, 3, 4 & 7) Coastal development (Items 5 & 6)
Domestic economic risks (DEcR)	5	2	45.2	Yes	Economic indicators (Items 1, 2 & 3) Economic growth (Item 4)
International economic risks (IEcR)	5	1	-	-	-
Domestic social risks (DSR)	5	1	-	-	-
International social risks (ISR)	3	1	-	-	-
Domestic political risks (DPR)	7	2	62.9	Yes	Poor governance (Items 1, 2, 5, 6 & 7) MPA enforcement (Item 3,4 & 5)
International political risks (IPR)	4	0	-	-	-

An analysis of the correlation matrix revealed the presence of most coefficients of 0.3 and above, thus supporting the factorability of the correlation matrix. To aid in the interpretation of the EFA, a rotated factor matrix and principal axis factoring were executed. The rotated factor matrix was performed on each of the risk categories; the risk categories that were successfully rotated were DER, IER, DEcR and DPR. These results are presented in Tables 5.10 to 5.13. Only four out of the eight risk categories were successfully rotated owing to the small number of items in some of the risk categories. The results of the rotated factors are discussed next. The different shades of blue in Tables 5.10 – 5.13 represent the groupings of the sub-factors and their items from Table 5.9 above.

5.7.1. Direct environmental risks (DER)

The research variables of interest included ten questions relating to DER. The results show that fish population reduction is the most important factor for dive operators (sub-factor 1 – items 3, 4, and 9), while the use of destructive fishing methods and the overfishing of reefs are also recognised problems in the EAME, as supported by the literature. These results are consistent with the mean for each of the top three direct environmental risks. The second factor rotated was coastal urbanisation (sub-factor 2 – items 2, 5, 7 and 8). Coastal urbanisation brings with it the growth of coastal communities, the need for more resources and the subsequent effects on the environments that are attracting these populations to coastal areas. The third factor is overuse of natural resources (sub-factor 3 – items 1 and 6). The overuse of marine resources leads to the vulnerability of coral reefs and the decreasing appeal of the destination image. These three factors explain 61.3% of the variance. Table 5.10 provides the factors for DER.

Table 5.10: Direct environmental risk (DER) factors

Item	Direct environmental risks (DER)	Sub-factor		
		1	2	3
4	Destructive fishing	0.919	0.315	
3	Overfishing	0.805		
9	Marine pollution: Floating marine debris	0.728		0.377
8	Marine pollution: Industrial and municipal discharge of waste		0.940	
2	Tourism overuse: Coastal development		0.620	0.484
7	Coral mining	0.384	0.605	
5	Sedimentation		0.533	0.480
6	Eutrophication			0.700
1	Tourism overuse: Diver impacts			0.601
10	Extraction of coral fauna and flora			

5.7.2. Indirect environmental risks (IER)

Indirect environmental risks are rotated into two factors. The first, being indirect environmental degradation (items 1, 2, 3, 4 and 7), relates to anthropogenic factors which, because of activities occurring some distance from coral reefs and even continents (e.g. climate change), are considered to have an impact on coral reefs. This factor is considered most important among dive operators with regard to indirect environmental risks. The second factor (items 5 and 6) considers coastal development. The industrialisation of coastal areas

also provides for increased development of ports and harbours to accommodate shipping and boat traffic. These two factors explain 65.9% of the variance. Table 5.11 provides the factors for IER.

Table 5.11: Indirect environmental risk (IER) factors

Item	Indirect environmental risks (IER)	Factor	
		1	2
3	Ocean acidification	0.906	-
1	Coral bleaching	0.699	0.432
4	Extreme weather events	0.604	-
2	Sea level rise	0.593	-
7	Marine pollution	0.570	0.523
5	Industrialisation of coastal regions	-	0.940
6	Increased shipping and boating	0.334	0.828

5.7.3. Domestic economic risks (DEcR)

The rotated factor matrix for domestic economic risks produced two factors. Factor 1 relates to economic indicators (items 1, 2 and 3). Economic indicators refer to inflation, interest rates and fuel prices and their effects on the economy and their impact on dive operators and the dive tourism industry (Chapter 3). The results indicate that price inflation has the greatest impact, which is consistent with the highest mean for domestic economic risks ($M = 3.94$). Factor 2 (item 4) highlights depressed local economic activity ($M = 3.53$). Consequently, the two factors explain 45.2% of the variance. Table 5.12 provides the factors for DEcR.

Table 5.12: Domestic economic risk (DEcR) factors

Item	Domestic economic risks (DEcR)	Factor	
		1	2
3	Price inflation	0.949	-
2	Increasing interest rates	0.620	-
1	High fuel prices	0.565	0.352
4	Depressed local economic activity	-	0.612
5	Economic impact of coral reef degradation	-	-

5.7.4. Domestic political risks (DPR)

The research variables of interest included seven questions relating to domestic political risks. The results show that poor governance is the most important factor for dive operators

(Factor 1 – items 1, 2, 5, 6, and 7). These items (1, 2, 5, 6, and 7) refer to government corruption, lack of service delivery and political instability leading to civil unrest and strikes. This is consistent with the findings, which consider all items for Factor 1 to be above the overall mean for DPR ($M = 3.24$). Factor 2 (items 3 and 4) groups both lack of MPA regulations and restrictive MPA regulations. These can be considered separate from other DPR as they are specific to local authorities and mostly disassociated from political disturbances. The two factors explain 62.9% of the variance. Table 5.13 provides the factors for DPR.

Table 5.13: Domestic political risk (DPR) factors

Item	Domestic political risks (DPR)	Factor	
		1	2
6	Political instability	0.862	-
7	Lack of service delivery	0.805	-
1	Civil unrest and/or strikes	0.796	-
2	Political instability	0.755	-
5	Restrictive government regulations	0.752	-
4	Government corruption	0.405	0.330
3	Lack of MPA regulations	0.324	-0.796

By providing a factor analysis it was possible to distinguish between groups of variables and to confirm the clustering of related items to draw further inferences as support for the findings. Accordingly, the EFA has provided a more in-depth understanding of the relevance of various items. Correlations between risk categories are discussed next.

5.8. CORRELATIONS BETWEEN RISK CATEGORIES

Table 5.14 provides the details of the non-parametric correlations using Kendall's tau_b test (τ). The results indicate the marked rows that may be considered to have significant correlations with other risk categories. Owing to the small sample size (77), any value above 0.1 is considered significant; however, only those values considered as significant by the two-tailed test will be discussed.

Table 5.14: Kendall's tau_b test (τ) for non-parametric correlations

Kendall's tau_b (τ)		DER	IER	DEcR	IeCR	DSR	ISR	DPR	IPR
DER	Correlation coefficient	1.000							
	Sig. (2-tailed)	-							
IER	Correlation coefficient	.638**	1.000						
	Sig. (2-tailed)	0.000							
DEcR	Correlation coefficient	0.038	0.231	1.000					
	Sig. (2-tailed)	0.765	0.067						
IeCR	Correlation coefficient	0.167	.362**	.310*	1.000				
	Sig. (2-tailed)	0.180	0.004	0.015					
DSR	Correlation coefficient	.259*	.510**	.327*	.424**	1.000			
	Sig. (2-tailed)	0.039	0.000	0.011	0.001				
ISR	Correlation coefficient	0.188	0.080	-0.098	0.133	0.242	1.000		
	Sig. (2-tailed)	0.135	0.529	0.443	0.294	0.058			
DPR	Correlation coefficient	0.035	0.088	0.103	0.181	.267*	.326**	1.000	
	Sig. (2-tailed)	0.777	0.483	0.418	0.147	0.035	0.010		
IPR	Correlation coefficient	.338**	0.241	0.097	0.172	.314*	.563**	.492**	1.000
	Sig. (2-tailed)	0.008	0.059	0.451	0.176	0.015	0.000	0.000	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

5.8.1. DER significance discussion

DER shows a correlation with IER (.638). This is the most significant correlation of all the risk categories. From the literature review discussed in Chapter 3, it is clear that local and global threats to the marine environment are closely linked to the loss of ecosystem goods and services. DSR (.259) is significant as growing populations along the coast are creating a greater demand for resources. Nevertheless, while IPR (.338) shows significant correlation with DER, it is not possible to draw any links.

5.8.2. IER significance discussion

IeCR (.362) may be attributed to regional events which culminate in the indirect impacts on coral reefs. Factors such as regional coastal development and increased economic activity in

neighbouring countries may have a strong correlation with IER. DSR (.510) was also found to have a significant correlation, which may be due in part to population growth and increased dependency on marine resources.

5.8.3. DEcR significance discussion

IEcR (.310) has a significant correlation with DEcR. Factors which affect the ability of a business to generate a profit have a significant effect and are therefore highly correlated with events occurring regionally or locally. Price inflation can be correlated to fluctuating exchange rates and price competitiveness in the category of IER. DSR (.327) could be a consequence of depressed local economic activity or high resource demand, resulting in inflation and high interest rates.

5.8.4. IEcR significance discussion

DSR (.424) is closely correlated to international economic risks and can be influenced by economic uncertainty and economic crises originating from regional economies or larger economies around the world. For example, the 2008 global financial crisis has had a lasting effect on global economic growth and recovery.

5.8.5. DSR significance discussion

Interestingly, DER (.259) and IER (.510) are strongly correlated with domestic social risks. This is a result of reliance on the marine environment for ecosystem goods and services, with excessive use thereof having a negative impact. Similarly, DEcR (.327) and IEcR (.424) are strongly correlated with DSR. This implies weaker economic growth and a slowdown in tourism arrivals, thus affecting social welfare. DPR (.267) and IPR (.314) show a significant correlation, affirming that political risks impact on communities and their livelihood.

5.8.6. ISR significance discussion

DPR (.326) and ISR (.563) significance has been calculated. Accordingly, and as demonstrated in the results, there appear to be linkages between the tourism industry and political risks. Terrorism in Kenya and neighbouring Tanzania has had a negative impact on the region. In addition, the outbreaks of Ebola had a severe impact on dive tourist arrivals in East Africa in 2014 and 2015. The resulting effects on the wider region have been felt as evidenced in Chapter 3. Political instability and neighbouring conflicts also show strong correlations.

5.8.7. DPR significance discussion

IPR (.492) has a strong correlation with domestic political risks. Domestic political instability closely correlates with government corruption and civil unrest, and can be linked to regional political uncertainty. Similarly, DSR (.267) and ISR (.326) are closely correlated. This signifies that social aspects of the region are affected by domestic political risks. Similarly, domestic political risks may have an effect on society.

5.8.8. IPR significance discussion

Regarding international political risks, a correlation was found between DER (.338), DSR (.314), ISR (.563) and DPR (.492). Political risks, as the results have shown, can have a severe impact on dive operators' businesses. The resulting impacts may be felt by communities and the wider society, which in turn affects the domestic economic situation. Regional instability can indirectly affect tourist arrivals, as can travel restrictions and visa regulations. These are closely linked to domestic political risks.

5.9. SUMMARY OF OVERALL RESULTS (PART A)

The data analysis and discussion of results were presented in this chapter. A summary of the overall results (Part A) is presented below:

5.9.1. Biographical information of dive operators

The majority of dive operators have been in business for ten years or more (82.35%), and 17.64% had been operating for four to six years. Most respondents (85.3%) stated that between 50 and 100% of their income is generated from scuba diving activities. In addition, 73.5% of the respondents indicated that 100% of their scuba diving activities occur on coral reefs. They also indicated that 97.1% of their dive operations are located within or close to MPAs. Dive tourists originate mainly from Europe (28.07%), with North Americans (17.54%) and other parts of Africa (16.67%) ranking highly. Domestic tourists (20.18%) are also considered to be a major source of dive tourists.

5.9.2. Overall results for risk categories

The overall results for risk categories were then explored. These results are colour coded by their level of impact based on the Likert scale (see Table 5.18). Table 5.15 provides the overall mean for the external risk categories.

Table 5.15: Overall mean for external risk category groups

	Risk groups (Domestic and international risks)				
	Environmental	Economic	Social	Political	Overall mean
Total mean	2.09	3.29	2.83	3.21	2.82

By risk group, including both direct/domestic and indirect/international risks, the risk category that dive operators perceive as having the greatest impact on their business is economic risks ($M = 3.29$). Political risks ($M = 3.21$) are second highest and social risks ranks third ($M = 2.83$). Environmental risks are ranked fourth and was perceived as the lowest risk category by dive operators ($M = 2.09$). The overall level of impact for external risks is moderate ($M = 2.82$).

By comparing the differences between domestic versus international risks, further conclusions could be drawn. Table 5.16 illustrates that, on average, while direct/domestic risks ($M = 2.86$) rank slightly higher than indirect/international risks ($M = 2.79$), dive operators perceive domestic and international risks to have a similar impact on their businesses. Table 5.16 shows a comparison of the results for domestic and international risks.

Table 5.16: Comparison of domestic and international risks

	Domestic vs. international risks		
	Direct/domestic risks mean	Indirect/international risks mean	Overall mean
Total mean	2.86	2.79	2.82

Figure 5.15 shows the results for each of the external risk categories. From the results obtained in Section 5.3, it is ascertained that international economic risks (IEcR) ($M = 3.34$) feature as the risks that have the most significant impact on dive operators' businesses. Domestic economic risks (DEcR) ($M = 3.24$) and domestic political risks (DPR) ($M = 3.24$) ranked as having the second highest impact. Based on the responses given to the five-point Likert scale, these risks are, on average, a moderate to high risk. International political risks (IPR) ranked third ($M = 2.92$), while international social risks (ISR) ($M = 2.87$) and domestic social risks (DSR) ($M = 2.79$) ranked fourth and fifth, respectively. Direct environmental

risks (DER) (M = 2.15) and indirect environmental risks (IER) (M = 2.02) were ranked as having the least impact on dive operators' businesses, and thus constitute a low risk.

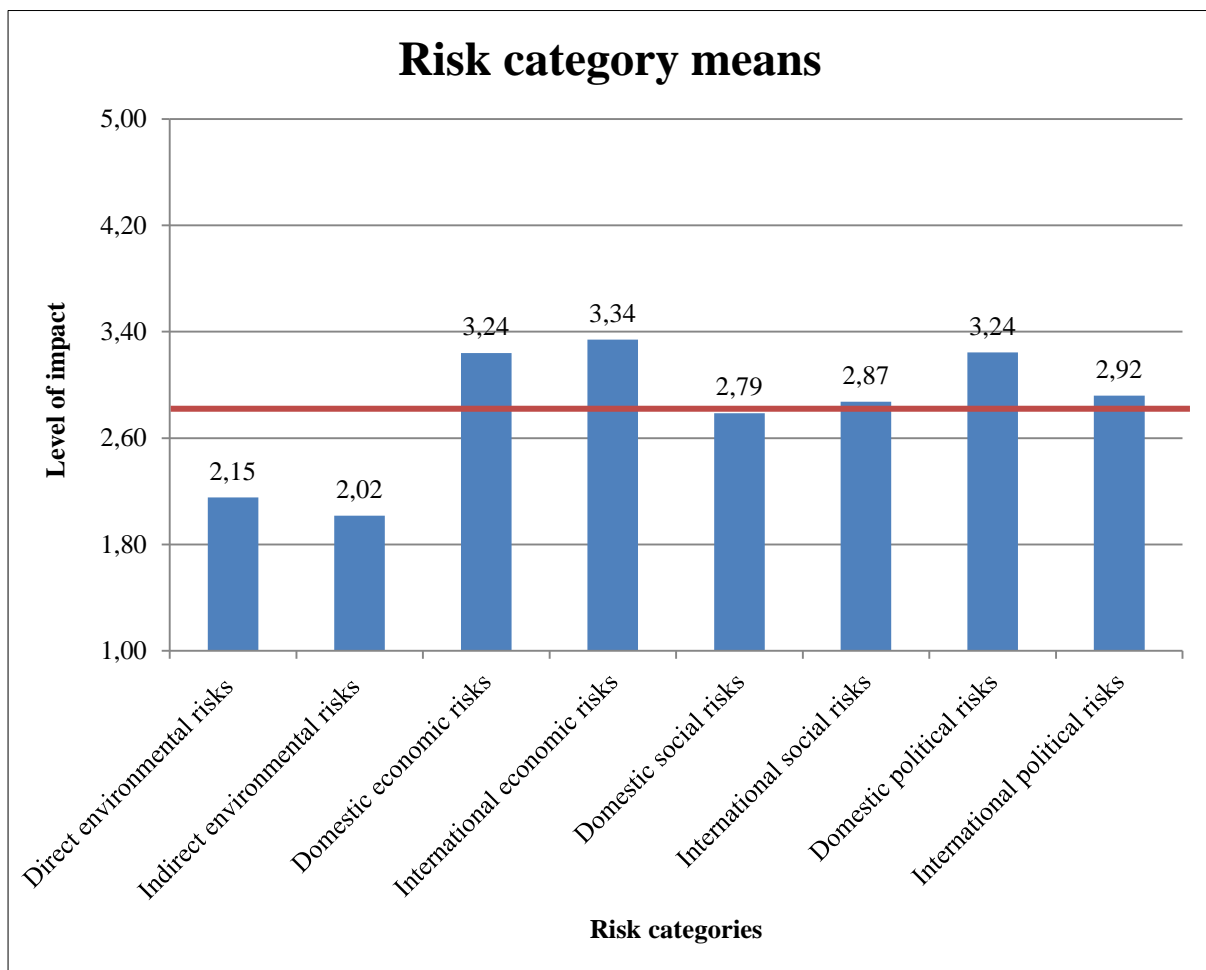


Figure 5.15: Overall means by risk category
 [Red line indicates overall mean for all risk categories (M = 2.82)]

A summary of the findings for environmental, economic, social and political risks is provided next.

5.9.3. Environmental risks

In terms of environmental risks, overfishing, marine pollution and destructive fishing featured as the highest direct environmental risks, while marine pollution (floating marine debris and plastics) and coral bleaching as a result of sea surface temperature (SST) rise were ranked highest for indirect environmental risks. The mean for DER displays a generally low impact (M = 2.15). Overall, for the East African region, overfishing, marine pollution (floating marine debris), destructive fishing, and tourism overuse (coastal development) fell

above the overall mean. The results of the primary data indicate that overfishing and destructive fishing have a high correlation with increasing populations along the coast leading to increased demand for marine-based resources. The mean for IER also displays a low impact ($M = 2.02$). Indirect environmental risks are ranked lowest of all external risk categories, with marine pollution (from shipping, floating marine debris, micro-plastics), coral bleaching (from past and current El Niño events) and extreme weather events being ranked above the overall mean.

5.9.4. Economic risks

For economic risks, price inflation ranked highest of all individual risks, while price inflation, depressed local economic activity and high fuel prices were ranked as the top three domestic economic risks. International economic risks ranked the highest among all risk categories, with respondents feeling that international economic recessions have the greatest impact on dive operators' businesses. Financial crises, dive tourist accessibility, price competitiveness and high exchange rates were also rated as having a high to very high impact. In addition, a strong correlation was found with DSR, thus indicating that economic recessions have a negative effect on local communities, resulting in depressed local economic activity. The overall mean ($M = 3.29$) for economic risks indicated a moderate risk, which scored the highest of all other risk groups, indicating its importance to dive operator businesses. The mean for DEcR indicates a moderate impact. For DER, price inflation, depressed local economic activity and high fuel prices all scored above the overall mean. All countries in the EAME perceive these risks as having a significant impact on dive operators' businesses. The mean for IEcR ($M = 3.34$) is moderate and is, in fact, the highest scoring overall mean for risk categories, with economic recessions and financial crises all scoring above the overall IEcR mean. Based on these findings, economic risks are expected to continue to be significant.

5.9.5. Social risks

In terms of social risks, domestic crime and population growth were considered to have a high impact on dive operators' businesses in the EAME, while in terms of international social risks, global disease epidemics and international crime (terrorism and piracy) were perceived as having a high impact on such businesses. The overall mean ($M = 2.83$) for social risks indicates a moderate impact, while the mean for DSR is moderate ($M = 2.79$) and crime, population growth along the coast and rising unemployment scored above the mean. The

mean for ISR is also moderate ($M = 2.87$), with global disease epidemics (Ebola and Zika viruses) and international crime (terrorism, piracy) being the most significant. International crime and global disease epidemics are considered to have had a high impact in the region. Strong correlations exist for environmental and economic risks, indicating that economic impacts have a negative effect on the communities in the region, also placing added pressure on the marine environment. Social risks also have a high correlation with domestic and international political risks.

5.9.6. Political risks

In terms of political risks, the overall mean ($M = 3.08$) indicates that they are a moderate risk in the region. The likelihood that political risks have impacted on and will continue to impact on the region is expected to continue as a result of continued political instability. The mean for DPR is moderate ($M = 3.24$) and political instability is ranked highest for this category. Restrictive government regulations, lack of service delivery, civil unrest and strikes, and government corruption all ranked as significant for dive operators. The resulting correlations with social risks are evident. The mean for IPR is moderate ($M = 2.92$). Travel restrictions and strict visa regulations imposed on countries are considered very significant. IPR also shows strong correlations with DPR and social risks.

In conclusion, at present dive operators perceive political risks (50%) to have the highest relevance, with economic risks (35.3%) also having a significant impact. In future, dive operators feel that environmental risks (26.5%) will have an increasing impact on the viability and sustainability of dive tourism businesses, although political (41.2%) and economic (29.4%) risks are still expected to dominate. Dive operators feel that most dive tourists are unlikely to visit the region if certain external risks are present. Nevertheless, over 61% of respondents have not implemented any adaptation strategies to reduce their exposure to external risks, indicating that most would be unprotected should significant events impact on their businesses.

PART B

5.10. CROSS-CASE ANALYSIS OF EXTERNAL RISKS

This section covers the cross-case analysis of results between countries (Kenya, Tanzania, Mozambique, South Africa). The results of each of the risks are tabulated to facilitate comparisons between countries. The Kruskal-Wallis test was used as a non-parametric test to allow for a comparison of scores between countries. Table 5.17 presents the findings of the Kruskal-Wallis test to confirm the findings of external risk constructs between countries by risk category.

Table 5.17: Kruskal-Wallis test by risk category per country in the EAME

Kenya	Tanzania	Mozambique	South Africa
Direct environmental risks (DER)			
15.00	26.90	17.63	8.89
Indirect environmental risks (IER)			
12.49	23.17	17.75	14.87
Domestic economic risks (DEcR)			
11.29	15.10	19.25	23.44
International economic risks (IEcR)			
8.64	18.45	19.50	21.56
Domestic social risks (DSR)			
6.64	20.35	24.31	16.72
International social risks (DSR)			
18.64	20.40	17.38	13.50
Domestic political risks (DPR)			
15.89	17.25	17.08	19.40
International political risks (IPR)			
18.43	21.85	16.31	13.00

Direct environmental risks (DER): Overall comparison by country shows that Tanzania experiences the greatest effects of the direct environmental risks (DER) (26.90). Mozambique is second highest (17.63) with Kenya (15.00) and South Africa (8.89) ranked third and fourth, respectively.

Indirect environmental risks (IER): The results show that Tanzania experiences the greatest effects as a result of indirect environmental risks (23.17). Mozambique is second

highest (17.75) with Kenya (12.49) and South Africa (14.87) ranked third and fourth, respectively.

Domestic economic risks (DEcR): Overall comparison by country shows South Africa (23.44) with the highest impact responses which experience the greatest effects as a result of domestic economic risks DEcR. Mozambique is second highest (19.25) with Tanzania (15.10) and Kenya (11.29) ranked third and fourth, respectively.

International economic risks (IEcR): Overall comparison by country shows South Africa (21.56) experiences the greatest effects of the international economic risks (IEcR). Mozambique is second highest (19.50) with Tanzania (18.45) and Kenya (8.64) ranked third and fourth, respectively, a very similar pattern to DEcR.

Domestic social risks (DSR): Overall domestic social risks (DSR) by country comparison show that Mozambique (24.31) experiences the greatest effects. Tanzania (20.35) ranks second highest with South Africa (16.72) and Kenya (6.64) ranked third and fourth, respectively.

International social risks (ISR): Overall comparison by country indicates that Tanzania (20.40) experiences the greatest effects of the international social risks (ISR). Mozambique is second highest (17.38) with Kenya (18.64) ranked third. South Africa (13.50) shows the lowest overall rating for international social risks.

Domestic political risks (DPR): Results for South Africa (19.40) experience the greatest effects for DPR. Tanzania (17.25) has the second highest, Mozambique is third highest (17.25) and Kenya (15.89) is fourth.

International political risks (IPR): Results show Tanzania (21.85) experiencing the greatest effects in terms of IPR, Kenya (18.43) had the second highest, Mozambique had the third (16.31) and South Africa (13.00) the fourth.

Section 5.3 indicated the overall results and ranking of external risks by risk category. A cross-case analysis follows which provides a comparison between the four EAME countries. This is achieved by going through each risk category one by one (DER, IER, DEcR, IEcR, DSR, ISR, DPR, IPR). Each risk category is presented using a risk radar diagram which provides an overall view of the highest risks per country. In each of the risk radar diagrams

presented in Part B, the various risks surround the radar, each country has its own colour, and the numbers represent the cumulative Likert scale results.

Within each of the risk categories, the individual risks are considered for further interpretation and analysis. The researcher will discuss the individual risks that score as a moderate risk ($M = 2.61$) or higher. The risk responses have been colour coded as shown in Table 5.25 to aid in the interpretation of results. This colour code is also used in the bar graphs which follow each risk radar diagram.

Table 5.18: Colour coding responses of external risks to assist in the interpretation of results

Level of impact colour code	Likert scale	Cumulative Likert scale results
No impact	1	1.00–1.80
Low impact	2	1.81–2.60
Moderate impact	3	2.61–3.40
High impact	4	3.41–4.20
Very high impact	5	4.21–5.00

In these sections, cross references back to the literature review in Chapter 3 are made to compare these results with previous research.

5.10.1. Direct environmental risks (DER)

Overfishing, marine pollution, destructive fishing and tourism overuse (coastal development and diver impacts) will be discussed in further detail below. Because sedimentation; extraction of coral fauna and flora; marine pollution: industrial and municipal discharge of waste; eutrophication and coral mining are not considered to have any degree of significance they will be excluded from further analysis. Presenting the results using the radar diagram in Figure 5.16 provides an overall view of the highest risks per country. From the results it is clear that Tanzania has the highest overall risks with regard to direct environmental risks.

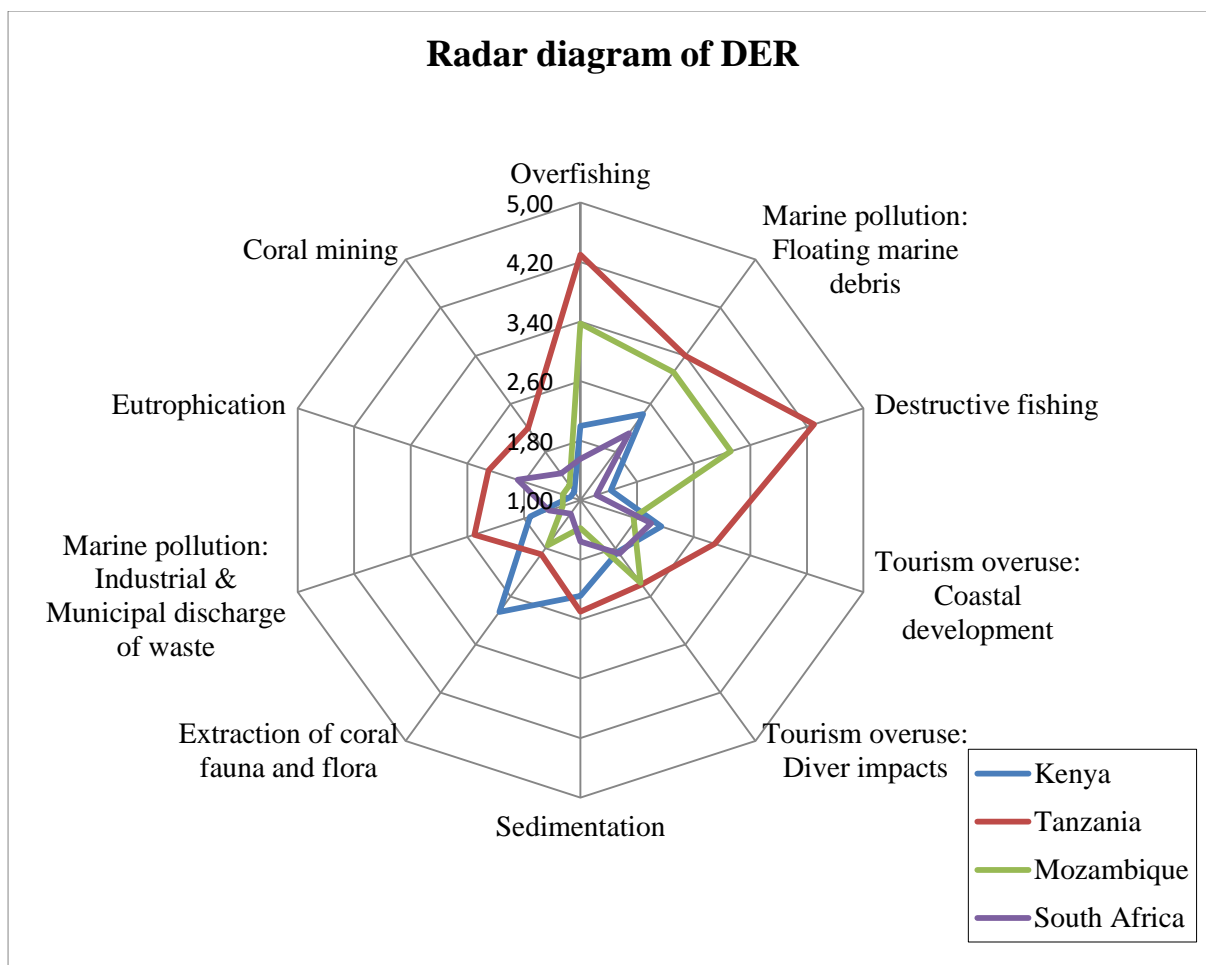


Figure 5.16: Radar diagram for direct environmental risks (DER)

a. Overfishing (on or near to coral reefs)

Figure 5.17 shows the results for overfishing by country in the EAME. Tanzania has the highest score when it comes to overfishing ($M = 4.30$; $SD = 0.95$). Most dive operators in Tanzania that ranked overfishing as having a high to very high impact were from Zanzibar Island. Although many parts of the island are classified as marine conservation areas, regulation and enforcement of environmental protection is not adhered to at the level which allows for the sustainability of coral reef dependent businesses such as scuba diving. Other dive tourism areas along the coast of Tanzania did not perceive overfishing to have as high an impact; however, findings in the literature (FAO, 2014) indicate that some 80% of fish stocks are currently being fished unsustainably (Section 3.4.1.2).

Mozambique scored second highest ($M = 3.38$; $SD = 1.60$). The respondents from central and northern Mozambique felt that overfishing is having a direct impact on coral reefs, specifically in Memba, Nacala and Pemba in northern Mozambique. This may be attributed

to the growing coastal population in the region. Southern Mozambique was perceived to be less of a problem when it comes to overfishing. One reason is that there is a growing level of enforcement by the Mozambique authorities, and heavy fines deter illegal fishing.

Kenya (M = 2.00) (SD = 1.15) and South Africa (M = 1.56) (SD = 0.88) fall below the overall mean for overfishing. Watamu in northern Kenya scored a high impact, however in no other areas in Kenya was it felt that overfishing was a concern. Illegal fishing vessels are often seen off the Kenyan coast, especially at night when they come into the shallow water to fish. These sightings are commonplace, but authorities have little effect in stopping illegal fishing.

South Africa reported the lowest impact given that fishing activities are only allowed for local shore anglers and recreational fishermen, who must have a fishing licence. Sodwana Bay is a popular angling destination; however, the sport is considered to have a low impact on coral reefs as most fish caught are larger pelagic fish which are found out past the coral reefs in deeper water. Dive operators in South Africa have expressed concern at the growing number of anglers, but they do not perceive this to be a significant risk to the reefs at present.

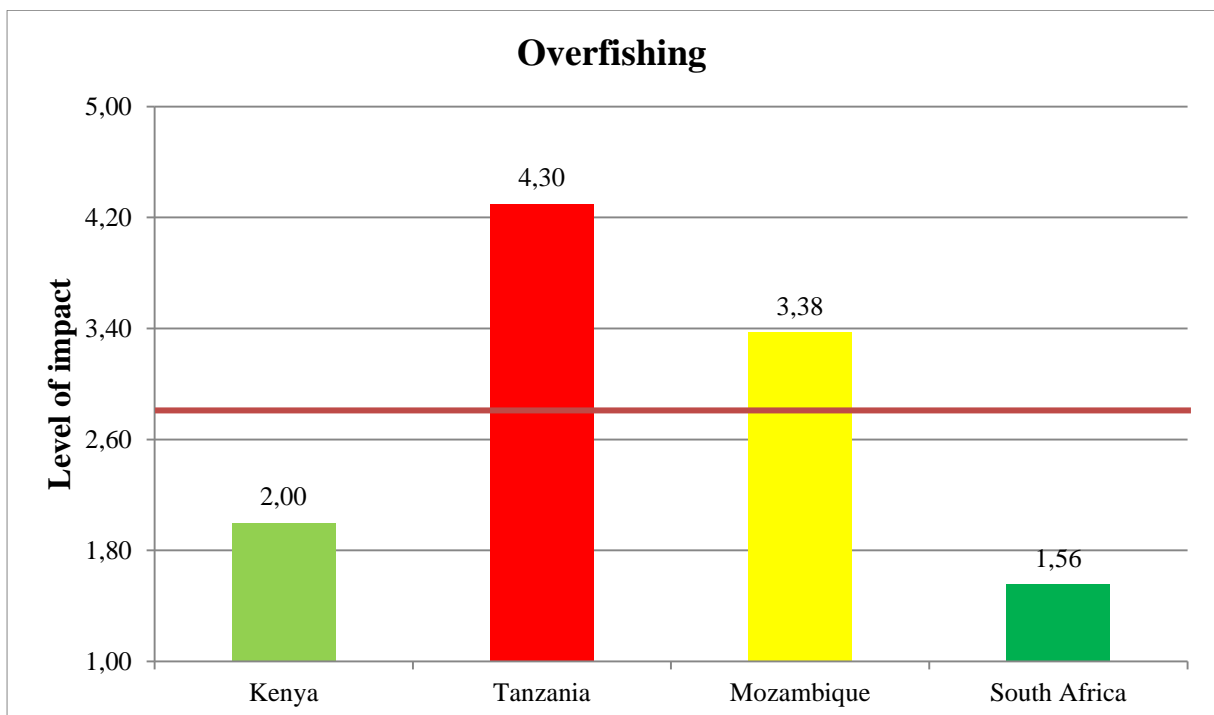


Figure 5.17: Overfishing

[Red line indicates the overall mean for Overfishing (M = 2.88) (SD = 1.59)]

b. Marine pollution (floating marine debris, effluent and waste, etc.)

Figure 5.18 illustrates marine pollution resulting from floating marine debris in the ocean. Marine debris (micro plastics, floating rubbish, disposed of fishing gear) has been shown to be a growing problem in East Africa. Tanzania (M = 3.40) (SD = 1.07) and Mozambique (M = 3.13) (SD = 0.99) have higher incidences of marine pollution, which are perceived to impact on coral reefs in the region. This finding is supported in the literature, which estimates that 80% of marine pollution is land-based and emanates from nearby coastal developments and ports (Paterson et al., 2012; Richmond, 2011) (Section 3.4.1.3). In Tanzania most respondents felt that marine pollution has a moderate to very high impact on coral reefs. This is particularly evident in highly populated coastal areas. Mozambique is also considered a high risk when it comes to marine pollution as dive operators along the length of the coast reported a high impact.

In Kenya (M = 2.43) (SD = 0.79), one dive operator in Ukunda felt that floating marine debris has a high impact although the responses indicated that most dive operators reported marine pollution as having a low impact along the Kenyan coast. South Africa (M = 2.11) (SD = 0.69) also reported a low impact.

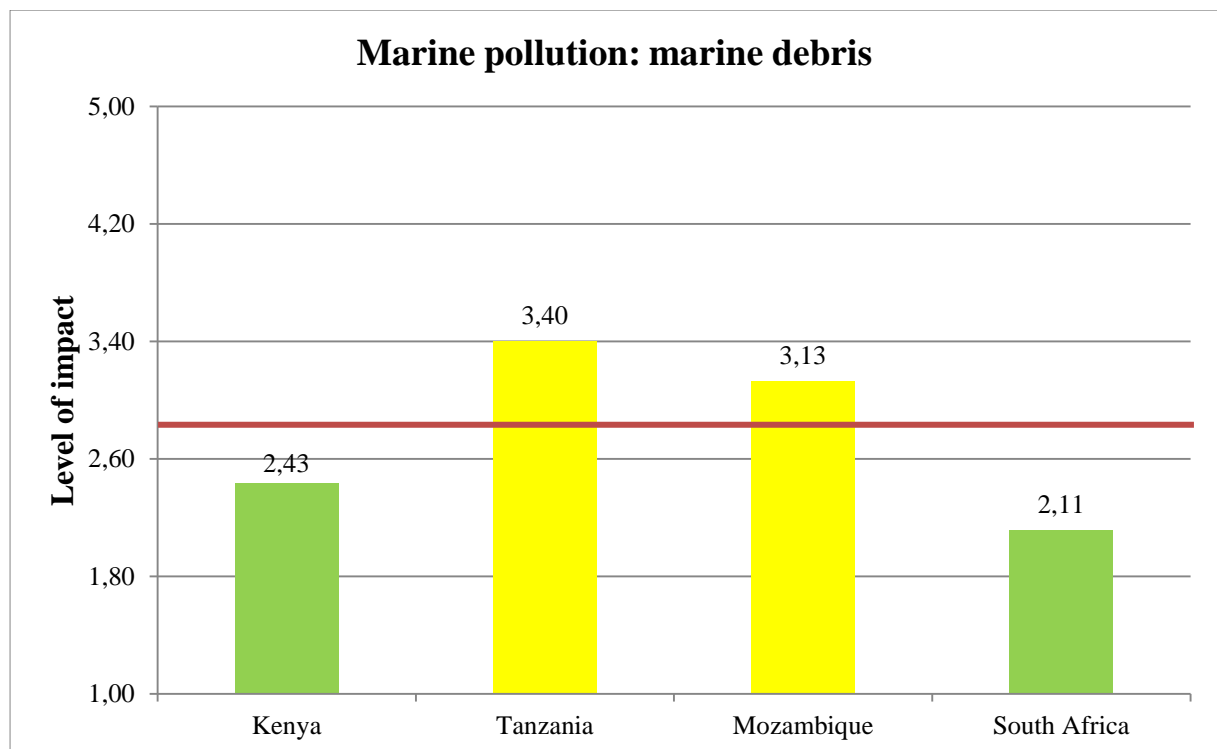


Figure 5.18: Marine pollution (marine debris) results

[Red line indicates the overall mean for Marine pollution: marine debris (M = 2.79) (SD = 1.01)]

c. Destructive fishing (on or nearby coral reefs)

Figure 5.19 shows the results of destructive fishing in the EAME. Overwhelmingly, Tanzania (M = 4.30) (SD = 1.06) reported a high to very high impact when it came to destructive fishing techniques employed to catch fish, resulting in the destruction of coral reefs. Studies confirm these findings and recent research indicates that coral reef degradation resulting from destructive fishing techniques is continuing (Burke et al., 2011; Obura, 2005a; Richmond, 2011) (Section 3.4.1.2). This is due to unregulated fishing which is occurring along the country's coastline. Tanzania's most popular island, Zanzibar, has experienced major problems with destructive fishing which is of great concern to dive operators as reefs are continuously being harmed due to this practice. Zanzibar Island consists of areas classified as marine conservation areas, but these have lower IUCN ratings than other MPAs along the East African coastline and therefore enjoy less protection. As a result, many traditional fishermen are using fishing methods which are not considered environmentally sound. While there has been an effort to promote more up-to-date fishing techniques and practices, these are not readily enforced on the fishing communities by authorities. This finding concurs with that of Worm et al. (2006) (Section 3.4.1.2), who found that the unregulated and poorly managed fishing industry is failing.

Mozambique (M = 3.13) (SD = 1.81) was found to be experiencing a moderate to high risk when it came to destructive fishing. Dive operators in northern and central Mozambique scored the highest, while those in southern Mozambique felt that destructive fishing generally has a low impact. However, issues still exist where reefs are being exploited and fished out using destructive fishing methods. This is particularly evident in central and northern Mozambique. Being the longest coastline in East Africa, Mozambique has only recently begun to enforce controls for the protection of its marine resources.

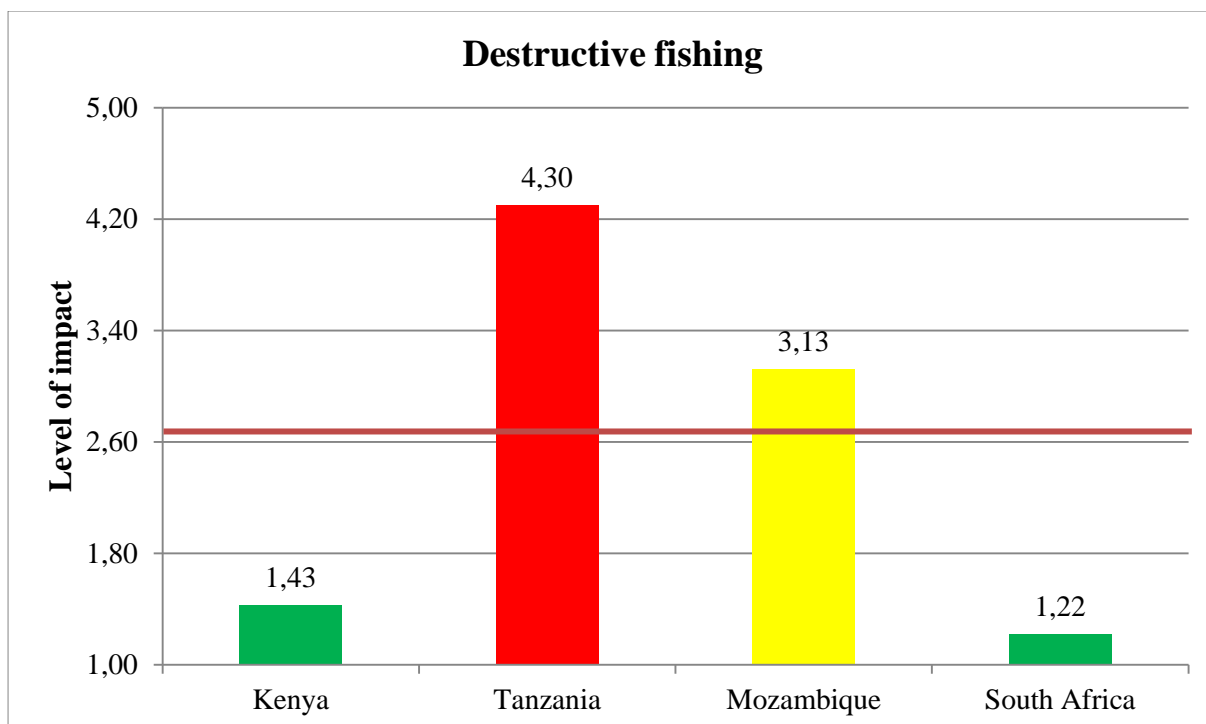


Figure 5.19: Destructive fishing

[Red line indicates the overall mean for Destructive fishing (M = 2.62) (SD = 1.72)]

Kenya ranked low on the risk of destructive fishing (M = 1.42) (SD = 0.79) as the Kenyan Wildlife Service (KWS) monitors its coastline and enforces strict penalties on fishermen who destroy coral reefs using destructive fishing methods. Kenya's topography of fringing reefs which are very close to the shore allows authorities to monitor activities closely, as only recreational activities such as snorkelling, scuba diving and surface water sports are permitted on the inner fringing reef. Fishing activities are only allowed on the outer fringing reef or the open ocean. South Africa (M = 1.22) (SD = 0.67) scored the lowest impact. Little to no impact of destructive fishing has been experienced in the central and northern reef complexes of the iSimangaliso Wetland Park.

d. Tourism overuse: coastal development (impacting on coral reefs)

Figure 5.20 illustrates the results of coastal development as an indicator of tourism overuse by country. Dive operators in Tanzania (M = 2.90) (SD = 0.88) felt that coastal development is having an impact on the health of the coral reef ecosystems. It is estimated that 32% of global coral reefs are threatened by coastal development and, as populations along the coast increase, the impact is expected to worsen, as described in the literature (Hinrichsen, 2011; Richmond, 2011). Further to this, the world's population is expected to increase along coastal regions over the next 50 years, adding to the pressures of coastal development (Burke et al.,

2011; Hinrichsen, 2011; Moore and Best, 2001; Richmond, 2011) (Section 3.4.1.1). Coastal development on Zanzibar Island was considered by the majority of dive operators to have a mostly moderate impact, however, one dive operator mentioned that coastal development is a serious threat to their area of operation and scored a very high impact. The only other incidence reported with a high impact was in Watamu, in Kenya's north coast ($M = 2.14$) ($SD = 0.90$), and Ponta do Ouro, in southern Mozambique ($M = 1.75$) ($SD = 1.04$). South Africa ($M = 2.00$) ($SD = 1.00$) shows little or no impact.

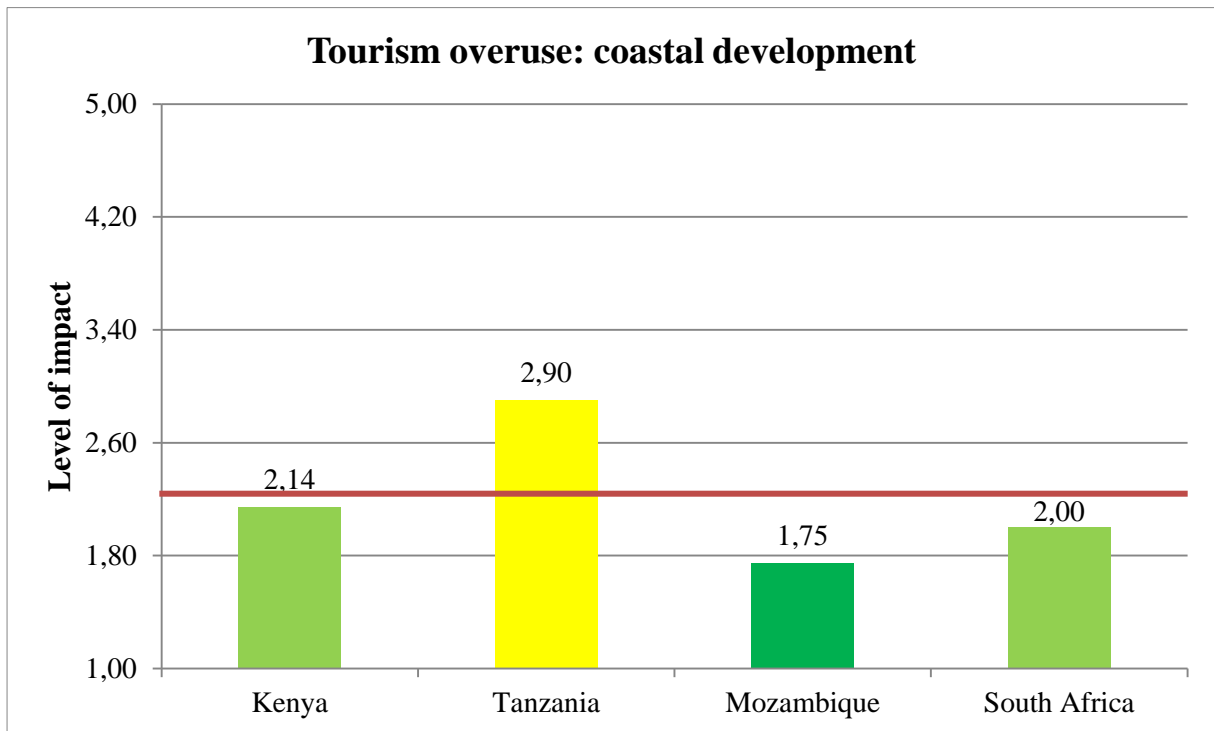


Figure 5.20: Tourism overuse: coastal development

[Red line indicates the overall mean for Tourism overuse: coastal development ($M = 2.24$) ($SD = 1.02$)]

e. Tourism overuse: Diver impacts

Figure 5.21 shows the results of diver impacts as an indicator of tourism overuse by country. The highest incidences of excessive use of dive sites by scuba divers and thus affecting coral reefs were recorded in Zanzibar Island, Tanzania ($M = 2.40$) ($SD = 0.97$). Ponta do Ouro, in southern Mozambique ($M = 2.38$) ($SD = 0.52$) reported a higher rate of impact compared to other areas further north. This could be attributed to the high number of dive tourists from South Africa who visit Ponta do Ouro. South Africa ($M = 1.89$) ($SD = 0.60$) showed little impact as a result of dive tourist numbers. This is a surprising result as South African coral reefs have a high number of dive tourists compared to other countries. There have been a number of studies conducted around the world relating to diver impacts on coral reefs.

Increasing the carrying capacity of divers on reefs has shown to degrade coral reef ecosystems (Floros et al., 2013; Salim et al., 2013) (Section 3.4.1.1). Kenya (M = 1.86) (SD = 0.38) reported little or no impact.

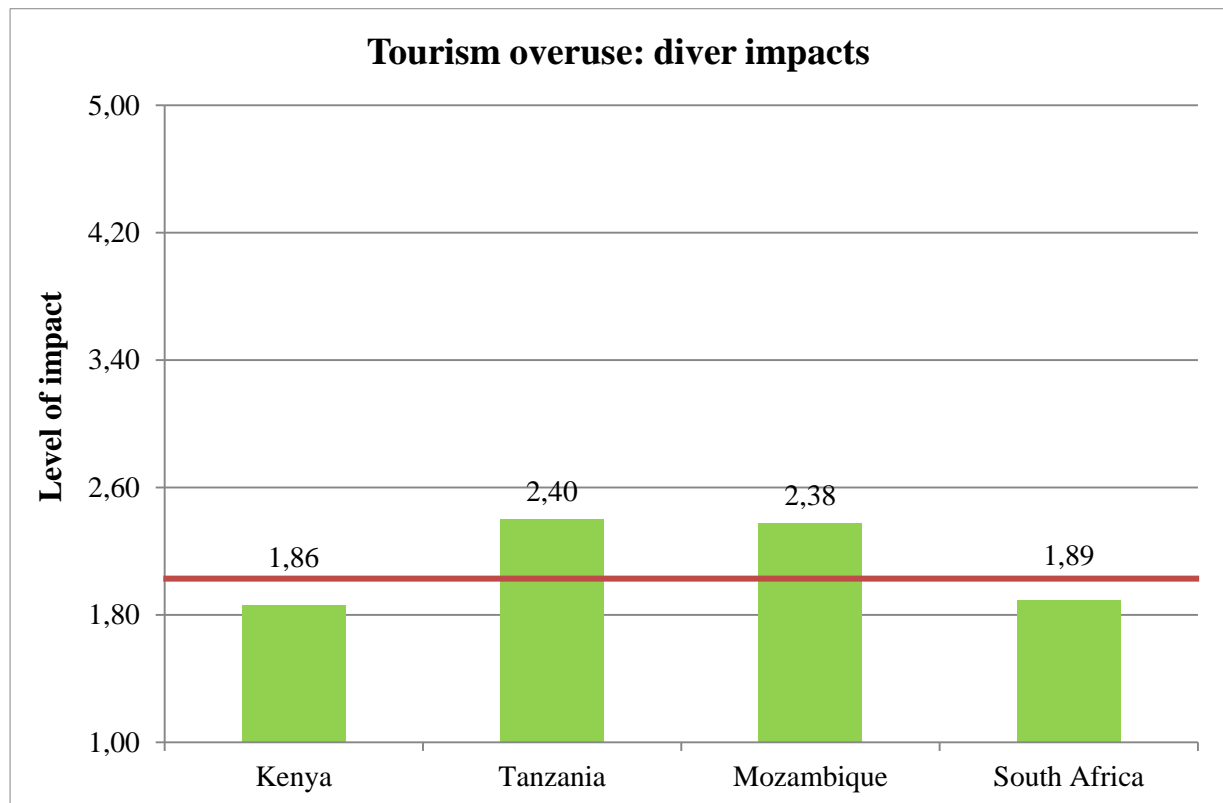


Figure 5.21: Tourism overuse: diver impacts

[Red line indicates the overall mean for Tourism overuse: diver impacts (M = 2.15) (SD = 0.70)]

5.10.2. Indirect environmental risks (IER)

The results for indirect environmental risks represented in the radar diagram below signify the higher level of impact in Tanzania. Figure 5.22 clearly shows that, while the level of impact for indirect environmental risks is low, there are a few individual risks which stand out in certain countries. This can be seen by the higher impacts presented by the red line which represents Tanzania. Here, marine pollution and coral bleaching are more significant. Marine pollution, coral bleaching and extreme weather events will be discussed in further detail as they fall above the overall mean (red line), as represented in Figure 5.22.

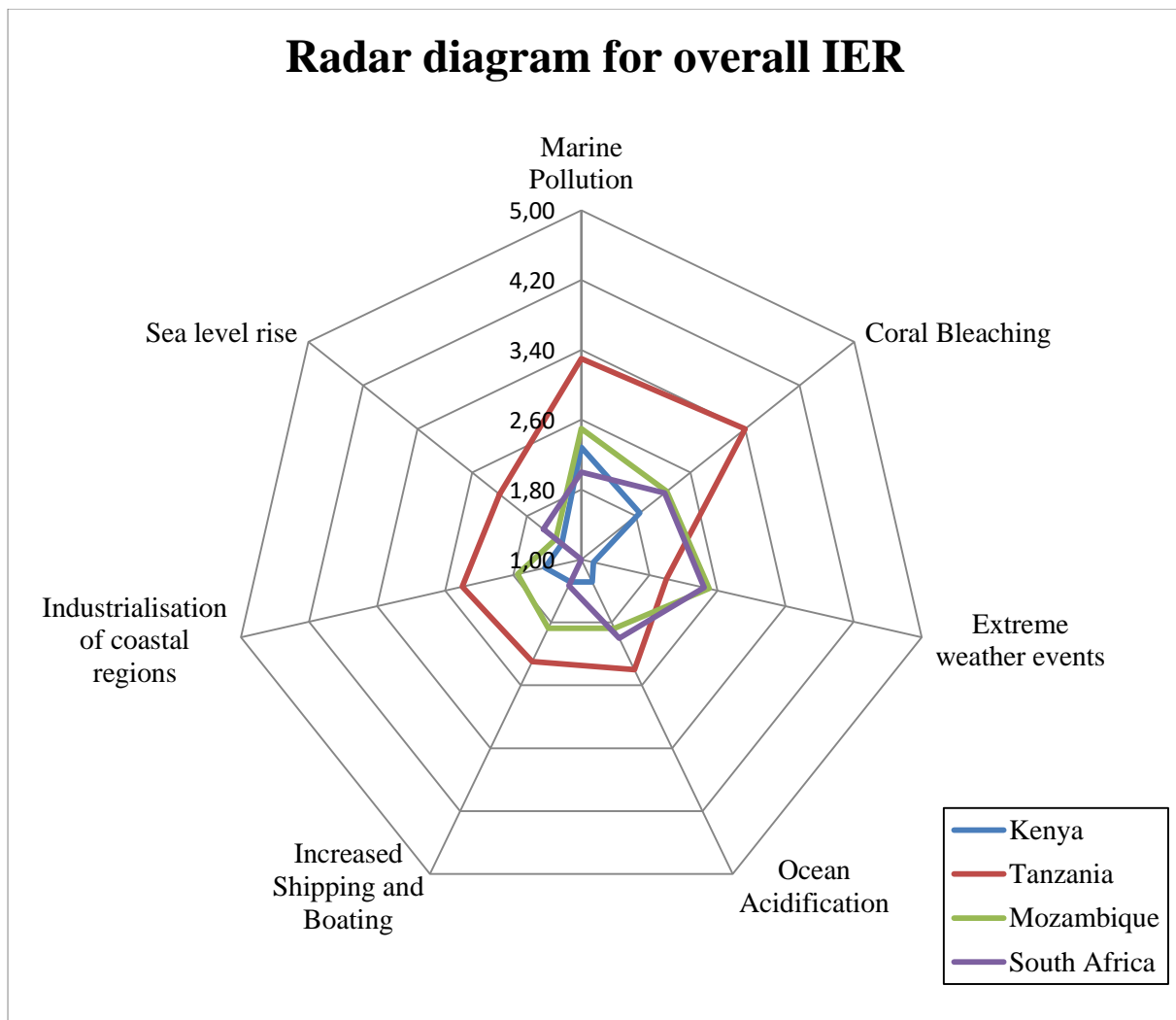


Figure 5.22: Radar diagram for overall indirect environmental risks (IER)

a. Marine pollution (plastics, marine debris, etc.)

Marine pollution (floating plastics and marine debris) ranked highest among the indirect environmental risks. Marine pollution originating from the open ocean has been shown to negatively affect coral reef ecosystems. Floating plastic, fishing gear debris and rubbish thrown overboard ships all contribute to the mass of marine debris that finds its way to coastal shores by ocean currents. Figure 5.23 shows marine pollution responses by country. Dive operators in Tanzania ($M = 3.30$) ($SD = 0.67$) felt that marine pollution is a problem that needs to be addressed and viewed it as having a particularly high impact. Those in Mozambique ($M = 2.50$) ($SD = 0.53$) acknowledge there is a problem but do not consider marine pollution drifting onto reefs from other parts of the ocean to be impacting on their coral reefs. This is supported by the literature which indicates that marine pollution is a rising threat to the marine ecology. Marine debris is an increasing problem and although much

pollution is out at sea, ocean gyres are pushing this pollution towards coastal and shallow ocean regions (Danovaro et al., 2008). Pereira et al. (2014) indicate that marine pollution is becoming an increasing problem in Mozambique (Section 3.5.1.4). South Africa ($M = 2.00$) ($SD = 0.87$) and Kenya ($M = 2.29$) ($SD = 0.95$) are seen as a low risk.

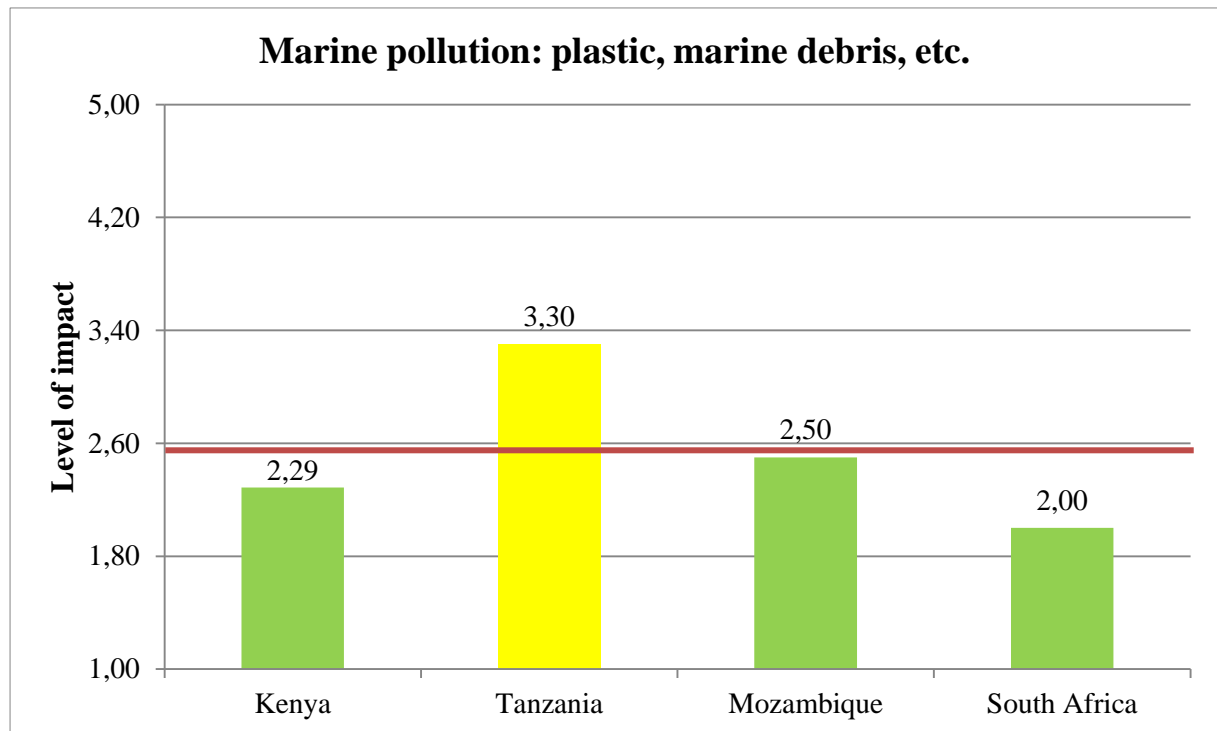


Figure 5.23: Marine pollution (plastics, marine debris)

[Red line indicates the overall mean for Marine pollution (plastic, marine debris) ($M = 2.56$) ($SD = 0.89$)]

b. Coral bleaching (as a result of sea surface temperature rise (SST))

Coral bleaching resulting from increasing sea surface temperatures (such as was caused by the recent El Niño event of 2015/2016) has had a devastating effect on coral reefs (NOAA, 2016). The 1998 El Niño event destroyed much of the coral off the east coast of Africa (50% mortality on most reefs closer to the equator, according to Obura (2005b)), and has in some instances not yet fully recovered (Section 3.5.1.1). Sustained sea surface temperature rises have been shown to cause irreversible harm to coral reef ecosystems and these effects can be seen long after such events have passed.

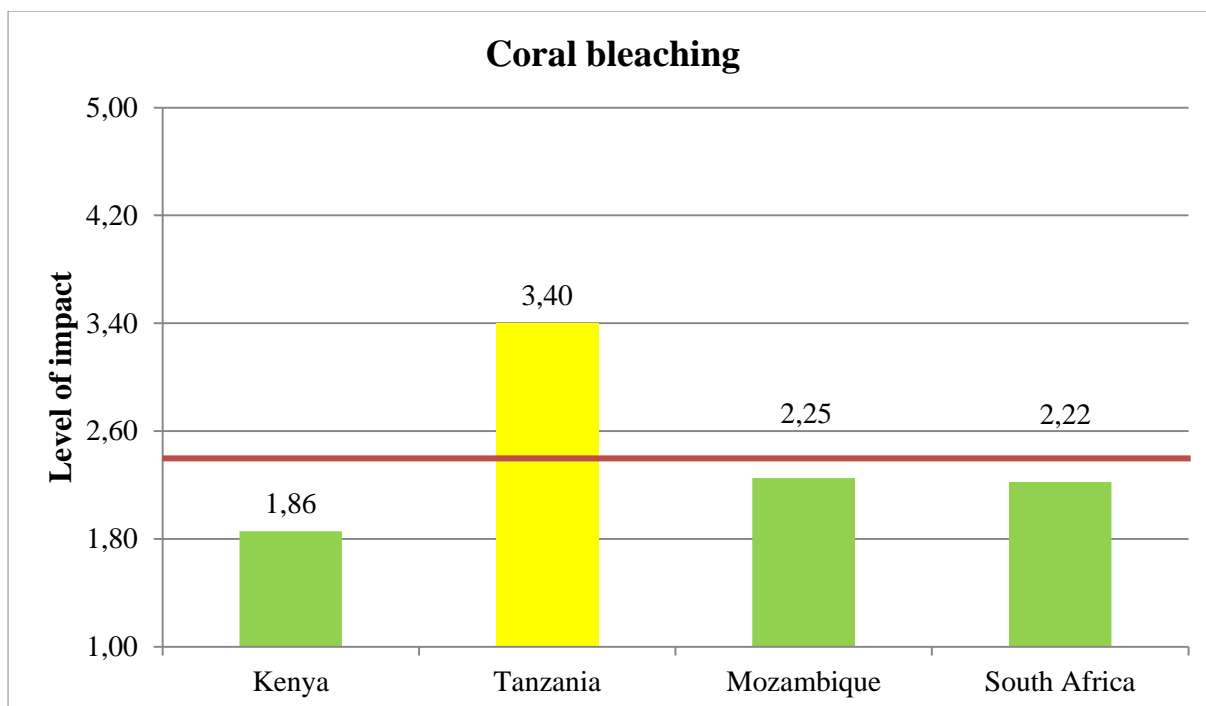


Figure 5.24: Coral bleaching (SST)

[Red line indicates the overall mean for Coral bleaching (M = 2.50) (SD = 1.11)]

Figure 5.24 shows the perceived impact that coral bleaching has on coral reefs. The coral reefs in Tanzania (M = 3.40) (SD = 0.52) have suffered extensively from previous coral bleaching episodes, and dive operators along the entire Tanzanian coast perceive this to be one of the greatest environmental impacts. This could be as a result of the fact that shallow reefs in Tanzania would be more sensitive to heat variations than reefs which are in deeper waters off fringing reefs such as in Kenya (M = 1.86) (SD = 1.21). In addition, the ocean currents are cooler where reefs occur at higher latitudes such as in southern Mozambique (M = 2.25) (SD = 0.71) and South Africa (M = 2.22) (SD = 1.30). Incidents of coral bleaching have, however, been observed in all countries along the east coast of Africa, but not all countries have reported high levels of coral bleaching, especially those in high latitude reefs.

c. Extreme weather events (tropical cyclones, severe storms, etc.)

Figure 5.25 shows the extent to which extreme weather events may cause the destruction of coral reefs. Overall, most dive operators felt that this was not a risk that would have an impact on their dive operations. Dive operators in Mozambique (M = 2.50) (SD = 1.20) rated extreme weather events as the highest impact, while South Africa (M = 2.44) (SD = 1.13) scored the second highest. Given that these two countries are in a similar geographical range, these stretches of coastline may be more susceptible to severe and damaging storms than

other areas along the East African coast. However, there is evidence that climate change is causing more severe weather and that this is expected to occur at a higher frequency, as evidenced by Fischer and Knutti (2015) (Section 3.5.1.1). Tanzania (M = 2.00) (SD = 0.38) and Kenya (M = 1.14) (SD = 0.38) expressed little or no impact in their responses.

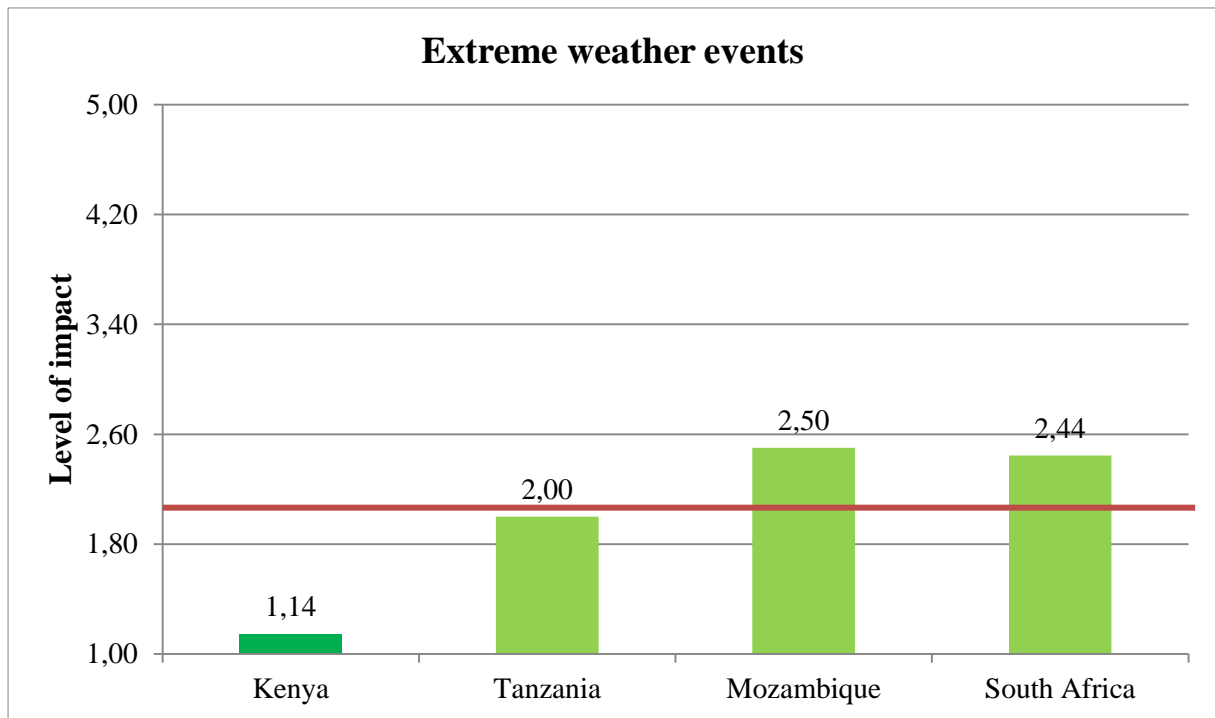


Figure 5.25: Extreme weather events

[Red line indicates the overall mean for Extreme weather events (M = 2.06) (SD = 1.01)]

5.10.3. Domestic economic risks (DEcR)

The radar diagram below (Figure 5.26) depicts the results of the individual domestic economic risks. These risks – high fuel prices, price inflation, depressed local economic activity and increasing interest rates – show a high prevalence of impact for South Africa and Mozambique (Kenya is also experiencing increasing interest rates).

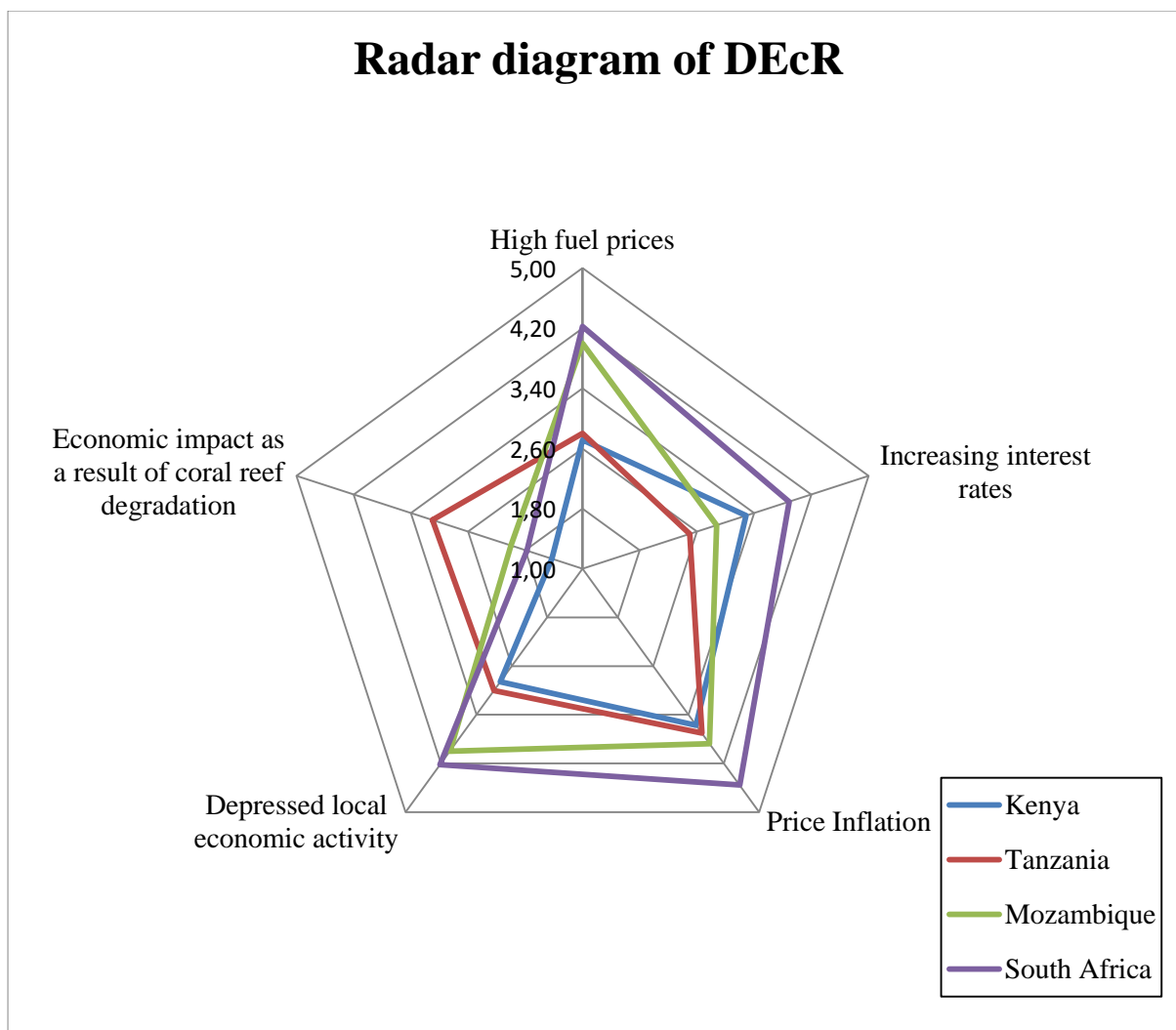


Figure 5.26: Radar diagram for domestic economic risks (DEcR)

a. Price inflation

Dive operators in the EAME feel that rising prices have a high to very high impact on their businesses. South Africa ($M = 4.56$) ($SD = 0.73$) ranked the highest for DEcR with a very high impact. Dive operators in South Africa perceive rising prices to be a key determinant of the sustainability of their dive operations. One respondent reported that it is one of the main reasons why dive operators have closed their businesses in recent times. The increasing inflationary pressures are supported by the findings which indicate that increasing costs of travelling in countries which have incurred inflation can reduce the amount of purchasing power for both international and local tourists (Yong, 2014) (Section 3.4.2.1). Mozambique ($M = 3.88$) ($SD = 0.83$), Tanzania ($M = 3.70$) ($SD = 1.06$) and Kenya ($M = 3.57$) ($SD = 1.13$) scored a high impact. Although there has been easing of inflationary pressure (as shown in

Table 3.7), depressed local economic activity has been experienced in the region, impacting on GDP growth (Table 3.8). Figure 5.27 is indicative.

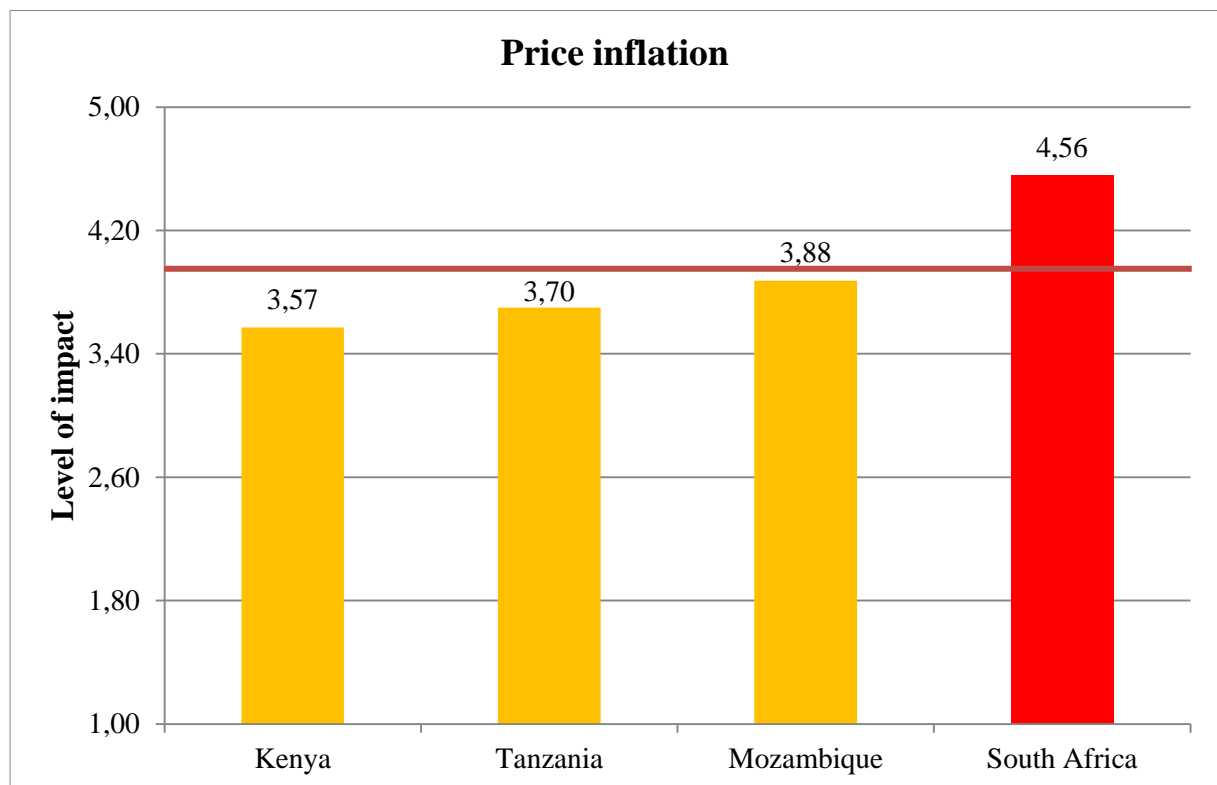


Figure 5.27: Price inflation

[Red line indicates the overall mean for Price inflation (M = 3.94) (SD = 0.98)]

b. Depressed local economic activity

The second highest DEcR is depressed local economic activity. South Africa (M = 4.22) (SD = 1.09) ranked the highest with a very high impact. South Africa fell into recession in 2016 (World Bank, 2016b) and is still experiencing slow growth. Along with Mozambique (M = 4.00) (SD = 1.07), it is perceived that the southern region is experiencing slow economic growth and decreased economic stability, resulting in a higher impact on dive operators. In Tanzania (M = 3.00) (SD = 1.15) and Kenya (M = 2.86) (SD = 1.77), operators felt this currently to have a moderate impact on their dive operations. This could be due to the fact that they are well positioned and receive a steady flow of tourists throughout the year, especially in Mombasa and parts of Zanzibar Island, even though low levels of economic growth in Kenya and fiscal tightening in Tanzania were experienced (Ng'wanakilala, 2017; Were et al., 2012). Figure 5.28 depicts the results for depressed local economic activity.

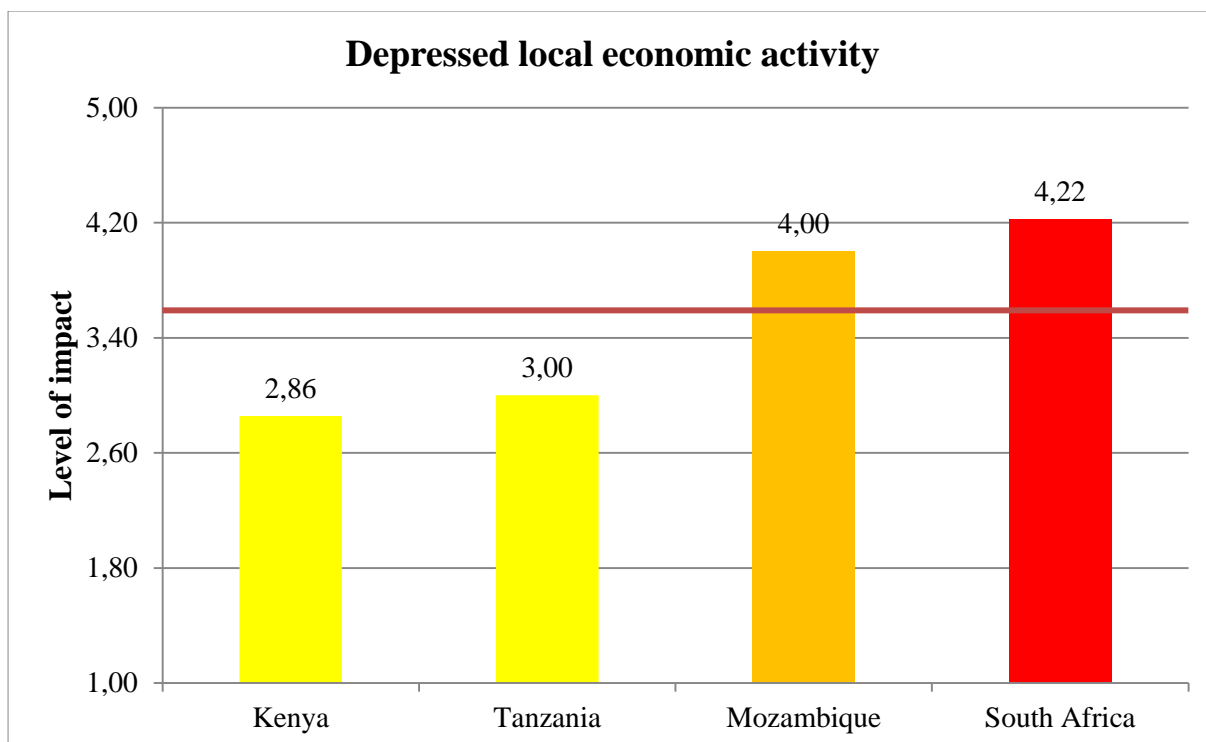


Figure 5.28: Depressed local economic activity

[Red line indicates the overall mean for Depressed local economic activity (M = 3.53) (SD = 1.35)]

c. High fuel prices

The overall mean for high fuel prices is 3.44 (SD = 1.13), indicating a high impact on dive operators' businesses in the region. South Africa (M = 4.22) (SD = 0.67) once again rates this domestic economic risk as having a very high impact. Similarly, Mozambique (M = 4.00) (SD = 0.76) rates this risk as high impact. Dive operators, particularly in the more remote regions of northern Mozambique, rated high fuel prices as having a very high impact. In Kenya (M = 2.71) (SD = 0.95) and Tanzania (M = 2.80) (SD = 1.23), fuel prices were reported to have a moderate impact. Figure 5.29 illustrates the responses in terms of the impact of high fuel prices. The implication of high prices is that dive operators' operating costs go up and the tourist's decision to travel is affected (Yong, 2014) (Section 3.4.2.1).

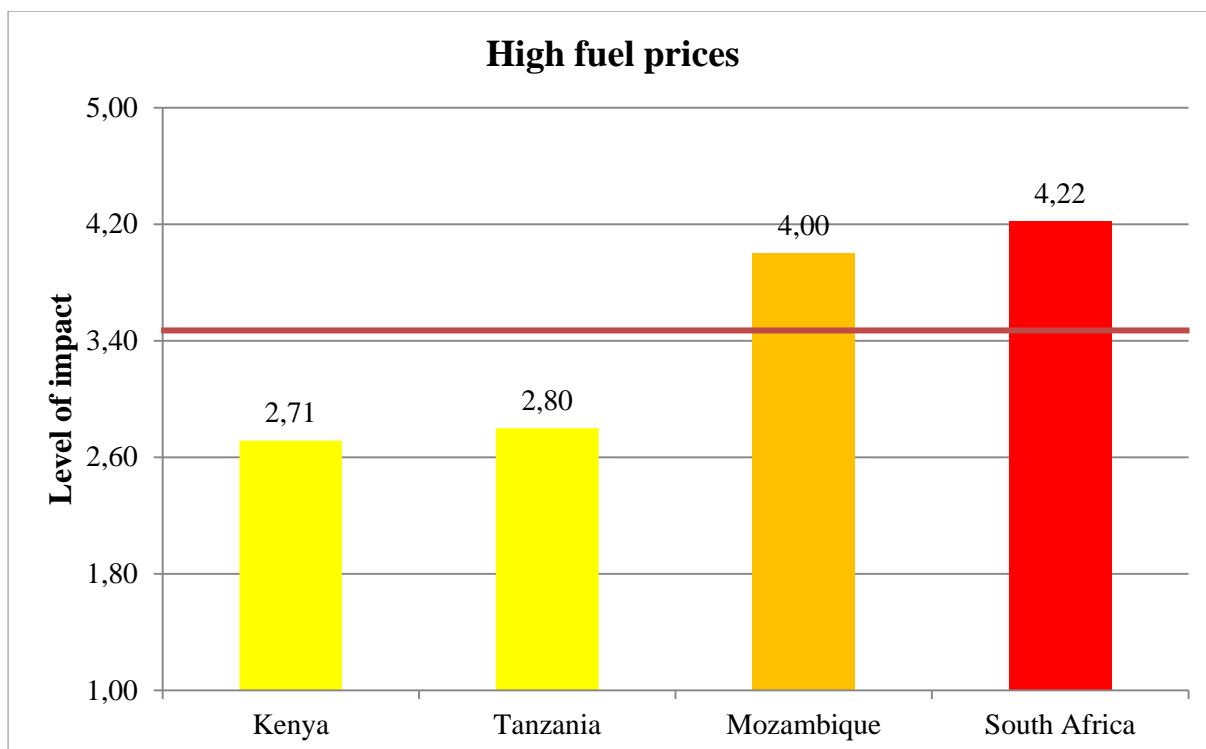


Figure 5.29: High fuel prices

[Red line indicates the overall mean for High fuel prices (M = 3.44) (SD = 1.13)]

d. Increasing interest rates

Figure 5.30 provides the responses for increasing interest rates. Respondents from South Africa (M = 3.89) (SD = 1.27) were mostly in agreement that rising interest rates affect their ability to borrow and had a significant impact on their businesses. Kenya was second highest (M = 3.29) (SD = 1.89), followed by Mozambique (M = 2.88) (SD = 1.25). Increasing interest rates indicate an inflationary climate often deterring tourists from travel (Shaw, 2010) (Section 3.4.2.1). From the results obtained for these three countries, a highly significant variance becomes apparent between different dive operators within countries. This large difference can be attributed to various dependencies on lending requirements. An interesting observation when comparing the results in Figure 5.30 against Table 3.6 in the literature review is that South Africa has a lower real interest rate than other countries in the region but sees it as a higher risk, attesting to the fact that dive operators in South Africa may be more reliant on borrowing. Dive operators in Tanzania (M = 2.50) (SD = 1.27) felt interest rates do not have much of an impact on their businesses.



Figure 5.30: Increasing interest rates

[Red line indicates the overall mean for Increasing interest rates (M = 3.12) (SD = 1.45)]

5.10.4. International economic risks (IEcR)

The risk radar in Figure 5.31 shows that Mozambique, Tanzania and South Africa perceive a high to very high impact when considering economic recessions, financial crises, price competitiveness and high exchange rates. South Africa and Mozambique consider dive tourist accessibility to have a very significant impact, given that most tourists in these two regions travel to these dive destinations from South Africa. Flights to these destinations are not plentiful and road conditions are relatively poor.

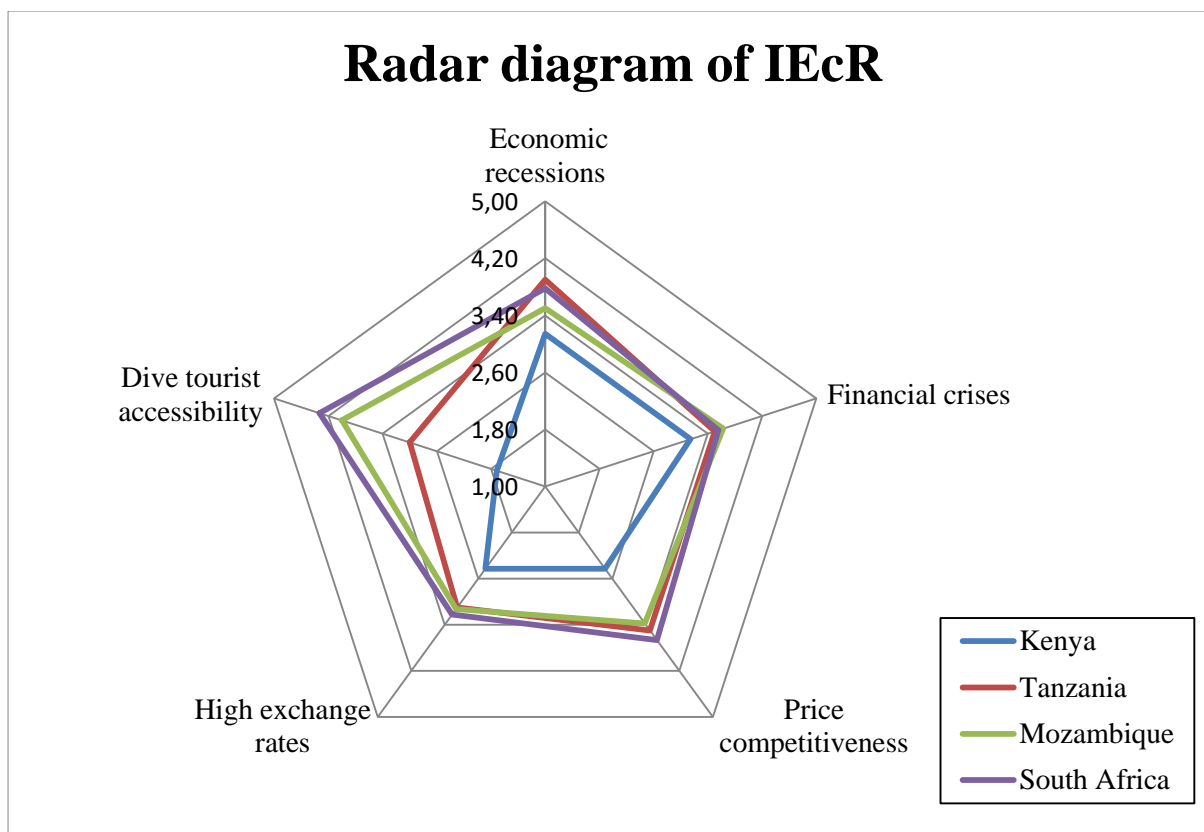


Figure 5.31: Radar diagram for overall international economic risks (IEcR)

a. Economic recessions

The highest impact perceived by dive operators as a result of international economic risks are periods of economic recession. Virtually all dive operators felt that prolonged global economic downturns impact severely on their businesses. This is evident in the responses from all regions of the EAME. The highest impact was recorded in Tanzania (M = 3.90) (SD = 0.57), followed by South Africa (M = 3.78) (SD = 1.30), Mozambique (M = 3.50) (SD = 1.41) and Kenya (M = 3.14) (SD = 0.69). Along with the economic recessions (Eugenio-Martin and Campos-Soria, 2013) that stemmed from the 2008 financial crisis (Pento, 2016), global economies shrank, creating depressed local markets (Africa, 2017; Ng'wanakilala, 2017; World Bank, 2016a). Figure 5.32 illustrates the results of economic recessions.

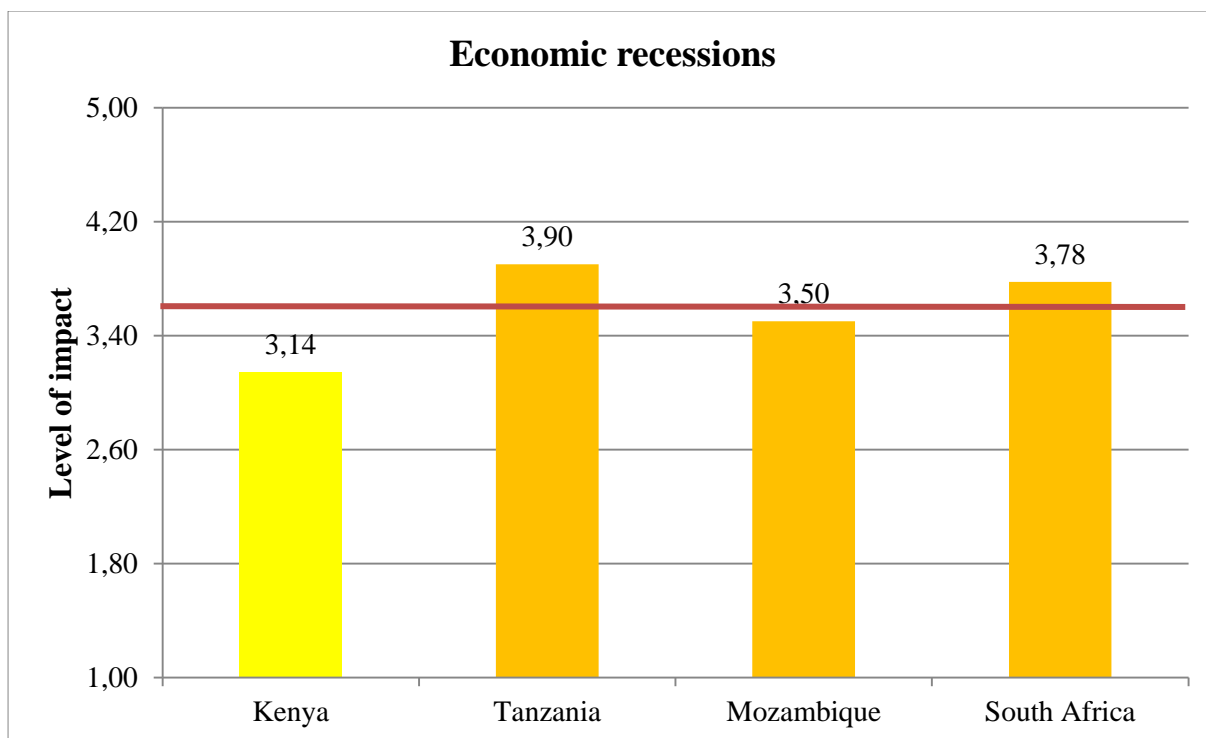


Figure 5.32: Economic recessions

[Red line indicates the overall mean for Economic recessions ($M = 3.62$) ($SD = 1.04$)]

b. Financial crises

Figure 5.33 provides the results of responses from dive operators regarding financial crises. It is clear from the responses that the effects of the 2008 global financial crisis are still being felt. Dive operators who were interviewed reported that the effects were still lingering and that neither their businesses nor those in the surrounding areas had fully recovered. Based on the data it appears that the greatest impact is being felt by Mozambique ($M = 3.63$) ($SD = 1.69$). Some dive operators in South Africa ($M = 3.56$) ($SD = 1.13$) mentioned in the structured interviews that they were very concerned that any future shocks could do irreparable damage to their businesses. Dive operators in Tanzania ($M = 3.50$) ($SD = 0.85$) were also affected, but Kenya ($M = 3.14$) ($SD = 0.69$) felt this to be a moderate impact.

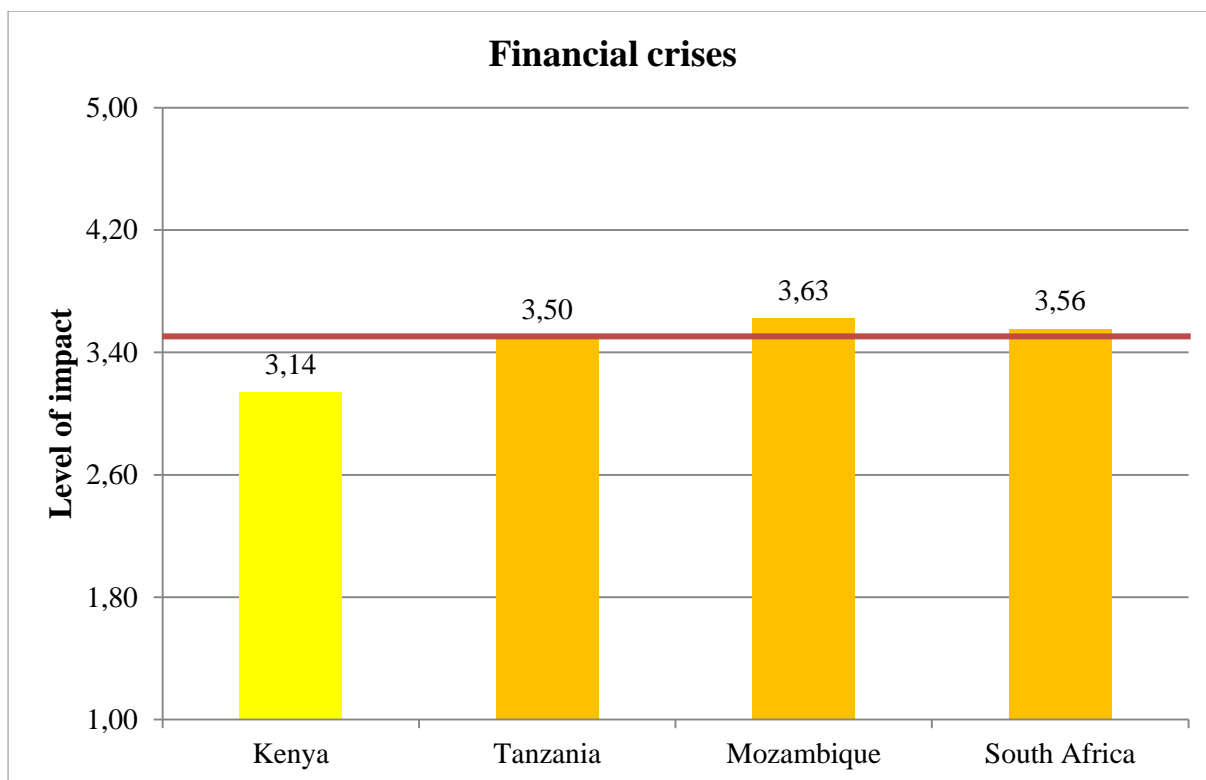


Figure 5.33: Financial crises

[Red line indicates the overall mean for Financial crises (M = 3.47) (SD = 1.11)]

c. Dive tourist accessibility

Dive tourist accessibility also ranked highly for some countries as impacting on businesses. South Africa (M = 4.33) (SD = 1.00) and Mozambique (M = 4.00) (SD = 1.51) ranked highest in terms of this impact. Access to dive destinations in these two countries requires lengthy road travel and unfavourable road conditions. Roads are often pot-holed, with dirt roads being the only access. Coupled with this is the need to cross borders by vehicle in the case of Mozambique, causing long delays. Dive operators see the lack of government support for infrastructure planning as one of the main problems in providing better access to their destination for dive tourists. In Tanzania (M = 3.00) (SD = 1.25), dive tourist accessibility is dependent on where the dive sites are located. On Zanzibar Island, for instance, access is geared for tourism and most areas do not consider access as having much of a bearing on their business. However, in remote locations it is considered more difficult. Kenya (M = 1.71) (SD = 1.11) is well geared for access as easy navigation by road and air makes travel up and down the coastline fairly straightforward. Figure 5.34 provides the results for dive tourist accessibility.

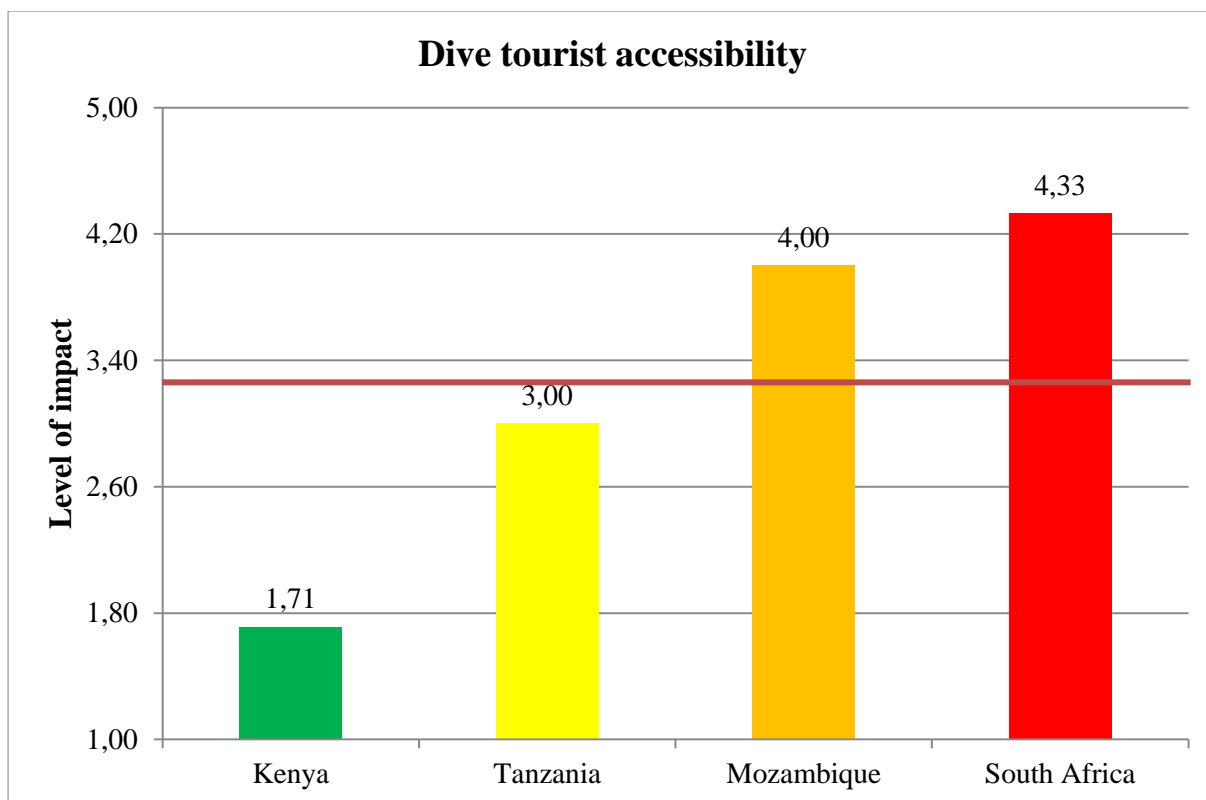


Figure 5.34: Dive tourist accessibility

[Red line indicates the overall mean for Dive tourist accessibility (M = 3.32) (SD = 1.53)]

d. Price competitiveness

The closer one dive operator is to another the more price competitive they will tend to be to attract dive customers. Dive tourism hotspots would be an example of such areas of stiff competition, such as in Sodwana Bay in South Africa (M = 3.67) (SD = 1.12) where all dive operators are located within one square kilometre of each other. Other examples are Zanzibar Island in Tanzania (M = 3.50) (SD = 0.85) and Inhambane in Mozambique (M = 3.38) (SD = 1.60). Dive operators in Kenya (M = 2.43) (SD = 1.40) are sparsely positioned along the length of the coast, and so their need to be price competitive is lower. Figure 5.35 provides the results for price competitiveness. The ability for dive tourists to travel to a dive destination is based on affordability. When assessing the value for money, better access to dive sites, and ease of travel to various destinations, dive tourists are more likely to travel to the more affordable and accessible spots (George, 2008; Shaw, 2010). This emphasises the benefits of improved access, using air travel via transport hubs to places like Zanzibar Island, Diani in Kenya, and the Bazaruto Islands in Mozambique.

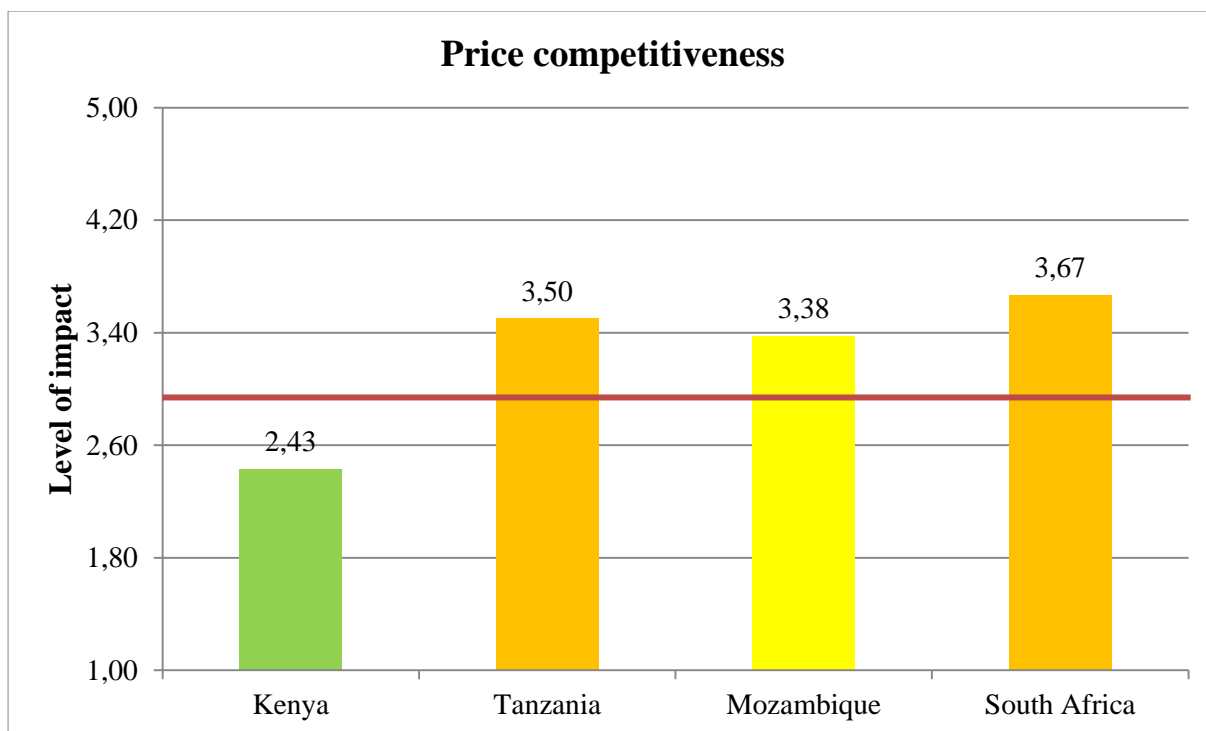


Figure 5.35: Price competitiveness

[Red line indicates the overall mean for Price competitiveness (M = 3.29) (SD = 1.27)]

e. High exchange rates

Weak exchange rates are considered a moderate risk among dive operators in the EAME. The results show that, overall, a high exchange rate is not considered as impactful as other international economic risks. In fact, a weak exchange rate attracts foreign revenues to the tourism industry, as indicated in the literature (Section 3.5.2.2). However, as dive operations are dependent on dive equipment and machinery (such as compressors, boat engines and dive gear) to operate efficiently, they require parts and servicing on a regular basis, which in many cases cannot be purchased locally. This added expense for a dive operator's business can have a very negative effect on their operation. South Africa (M = 3.22) (SD = 1.20), Mozambique (M = 3.13) (SD = 1.13) and Tanzania (M = 3.10) (SD = 0.74) rate this risk as moderate, while Kenya (M = 2.43) (SD = 0.79) considers this to be a low to moderate risk. Figure 5.36 shows the responses for high exchange rates.

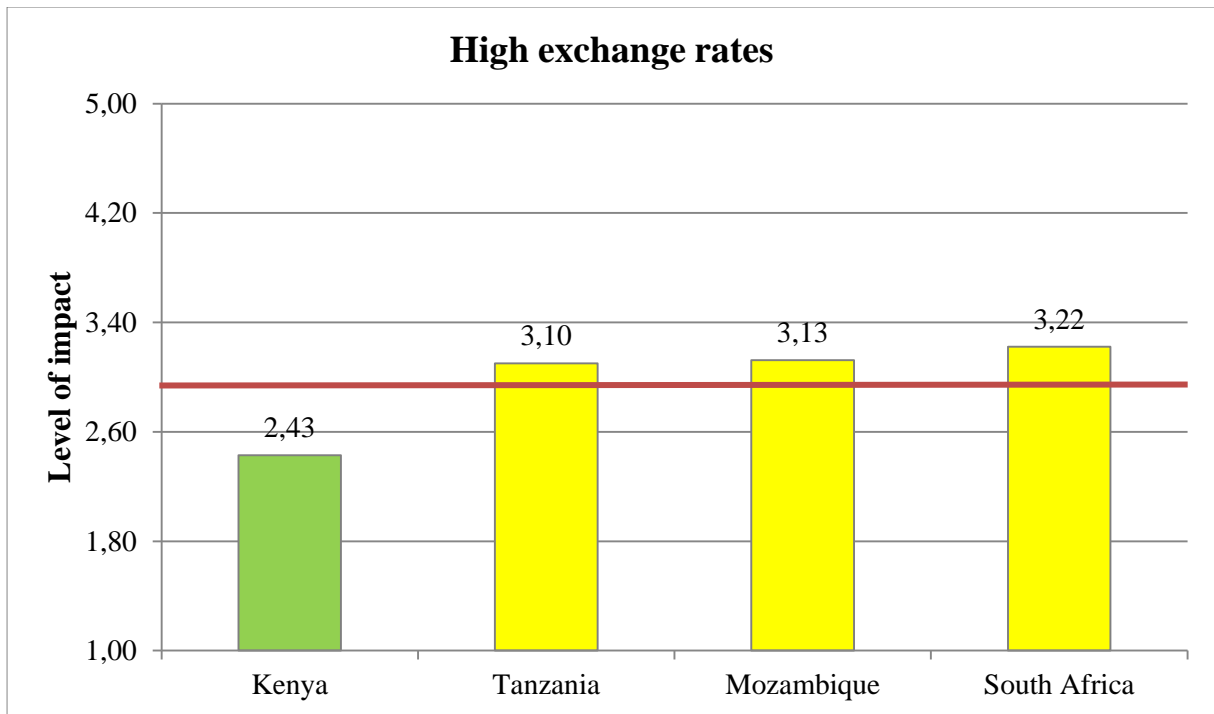


Figure 5.36: High exchange rates

[Red line indicates the overall mean for High exchange rates (M = 3.00) (SD = 0.98)]

5.10.5. Domestic social risks (DSR)

Figure 5.37 illustrates that the key impacts evident for Mozambique to be population growth along the coast, crime, increasing dependency on marine resources and rising unemployment. Mozambique has experienced an increase in coastal development and population growth in recent years (Hinrichsen, 2011) (Section 3.4.3.2). Results from Tanzania also show that population growth along the coast has a high impact on marine resources (Burke et al., 2011; Richmond, 2011), while South Africa considers crime to have the highest impact (SAPS, 2014).

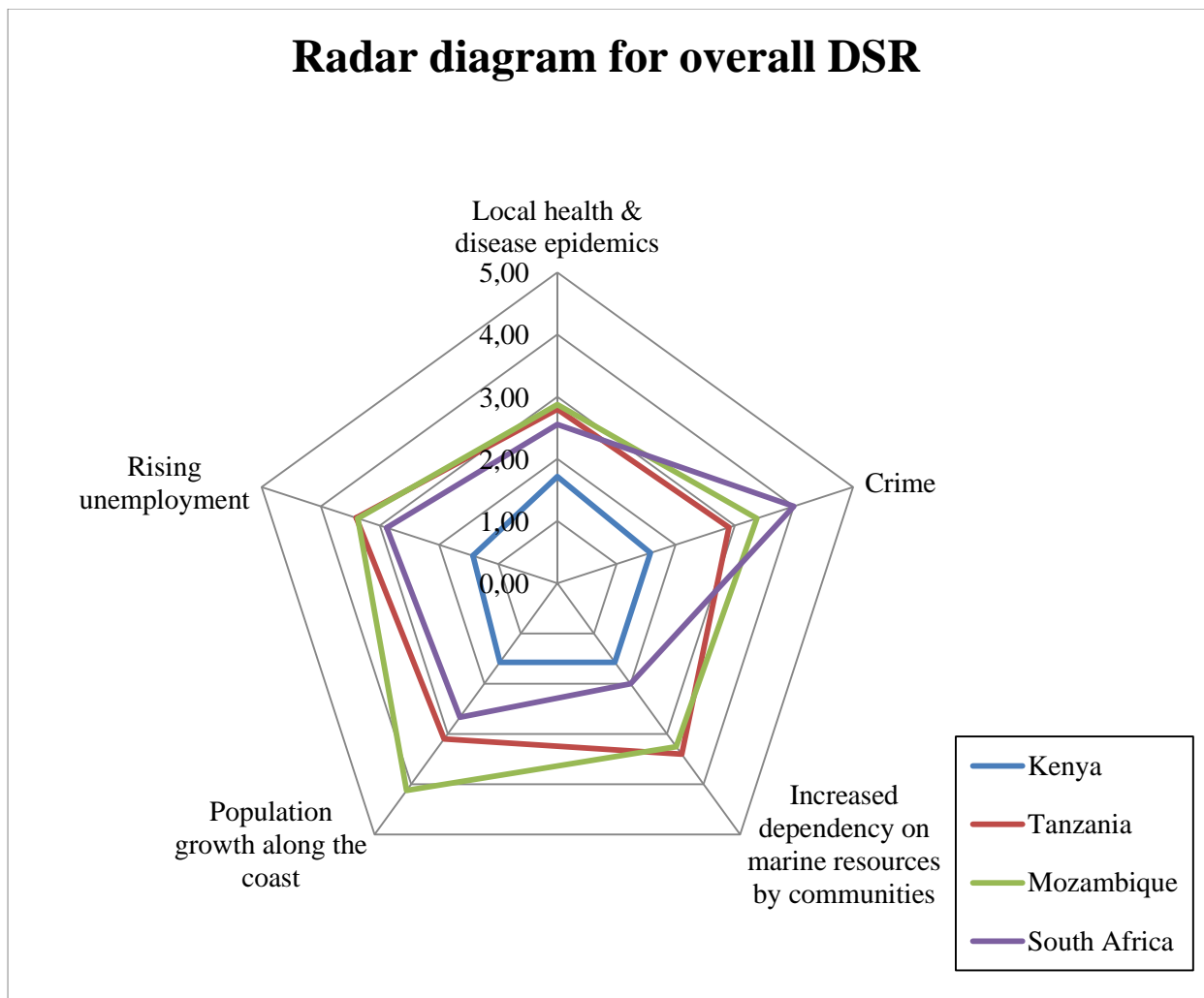


Figure 5.37: Radar diagram for overall domestic social risks (DSR)

a. Domestic crime (theft, violence, xenophobia, etc.)

Crime ranks as the most significant risk for DSR. Dive operators in South Africa ($M = 4.00$) ($SD = 1.22$) feel that crime is a major risk to their businesses. As most of the dive operators around Sodwana Bay are located outside the boundary fence of the iSimangaliso Wetland Park, crime has traditionally been a problem in the area. Mozambique ($M = 3.38$) ($SD = 1.41$) also registers high crime as an impact. Again, based on the results, crime incidents occur around dive tourism hotspots in places such as Ponta do Ouro and Inhambane. In Tanzania, crime is generally low key, but news reports of tourists being pick-pocketed and their belongings taken are commonplace, as evidenced in literature (Buchan and Calder, 2010) (Section 3.4.3.2). Dive operators on Zanzibar Island feel that this is a high impact, whereas those in the more remote locations such as Mafia Island for example, do not feel crime to be a

problem. Kenya ($M = 1.57$) ($SD = 0.79$), on the other hand, rates crime as having little or no impact. Figure 5.38 describes the results for local crime in the EAME.

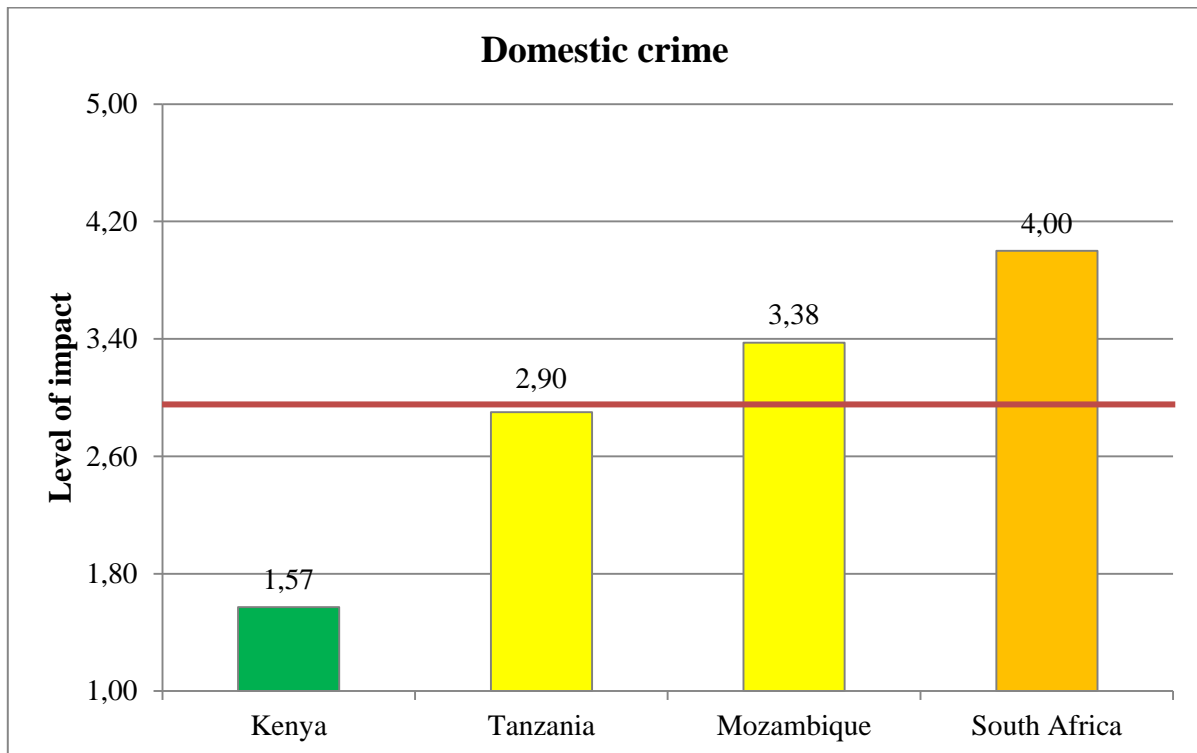


Figure 5.38: Domestic crime

[Red line indicates the overall mean for Domestic crime ($M = 3.03$) ($SD = 1.45$)]

b. Population growth along the coast

Figure 5.39 illustrates the population growth along the coast. Dive operators in Mozambique feel that the population increase along the coast is placing greater demands on marine natural resources and is therefore considered a high impact. While tourism growth brings with it opportunities for local communities to earn a living, it also attracts people from further away who come to beaches and resorts looking for work. One example is the ‘beach boys’ of Kenya, who approach tourists along the coast and are frequently seen offering boat rides and snorkelling trips, or selling curios to tourists. The literature in Chapter 3 supports the correlation between increasing population in coastal areas and the increased dependency on marine resources (Section 3.4.3.2), over-exploitation of marine resources (Section 3.4.2.3), and overfishing and destructive fishing (Section 3.4.1.2).

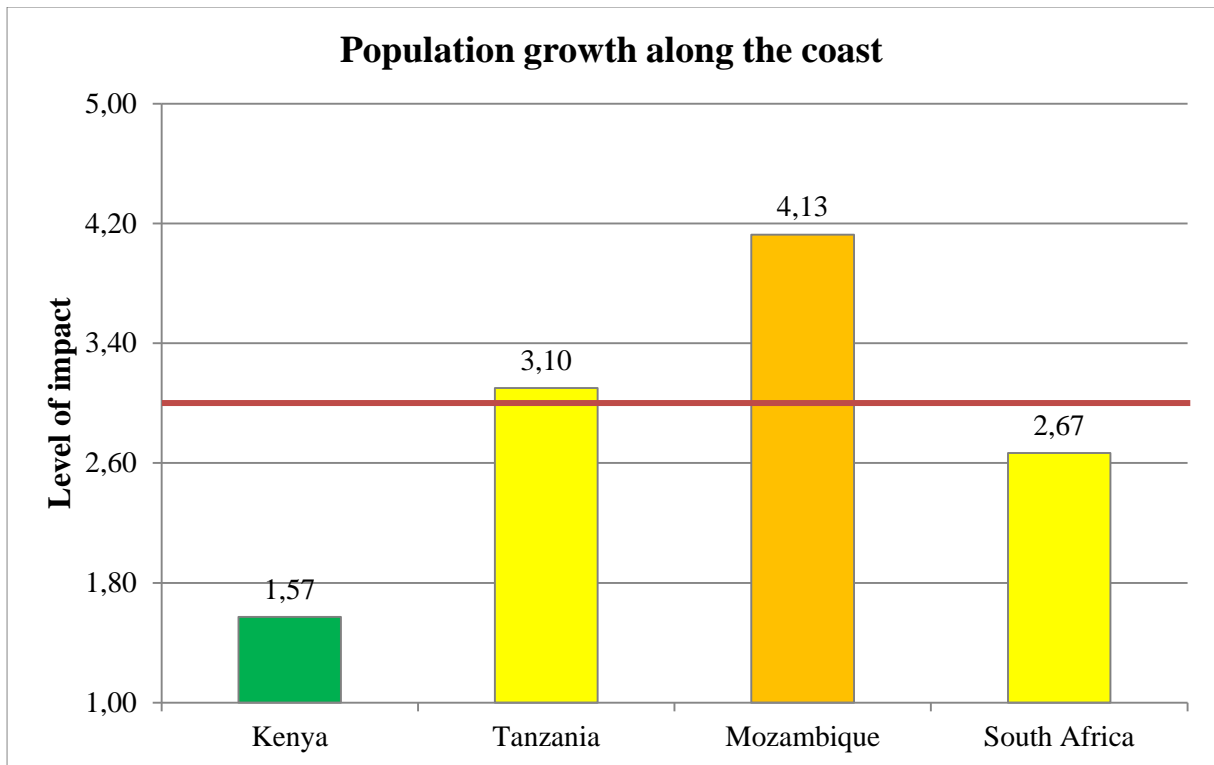


Figure 5.39: Population growth along the coast

[Red line indicates the overall mean for Population growth along the coast (M = 2.91) (SD = 1.44)]

Dive operators in Tanzania (M = 3.10) (SD = 1.10) also feel that increasing population growth along the coast has a moderate to high impact. South Africa (M = 2.67) (SD = 1.41) shows a moderate impact, while Kenya (M = 1.57) (SD = 0.79) feels that any population increase has little or no impact.

c. Rising unemployment

Studies have found that the tourism sector has few linkages with the local economy, resulting in a limited impact on poverty reduction (Hofmeyer, 2013; Rotarou, 2014) (Section 3.4.3.2). Such studies have been conducted in places like Zanzibar Island and Sodwana Bay and highlight that although tourism is a mechanism for employment, it still provides relatively few benefits for local communities (Mograbi and Rogerson, 2007; Rotarou, 2014). In Tanzania (M = 3.40) (SD = 0.97), Mozambique (M = 3.38) (SD = 1.19) and South Africa (M = 2.89) (SD = 1.45), this is considered to be a moderate risk but Kenya (M = 1.43) (SD = 0.45) does not regard this as a risk. Figure 5.40 illustrates the risk of rising unemployment in the EAME.

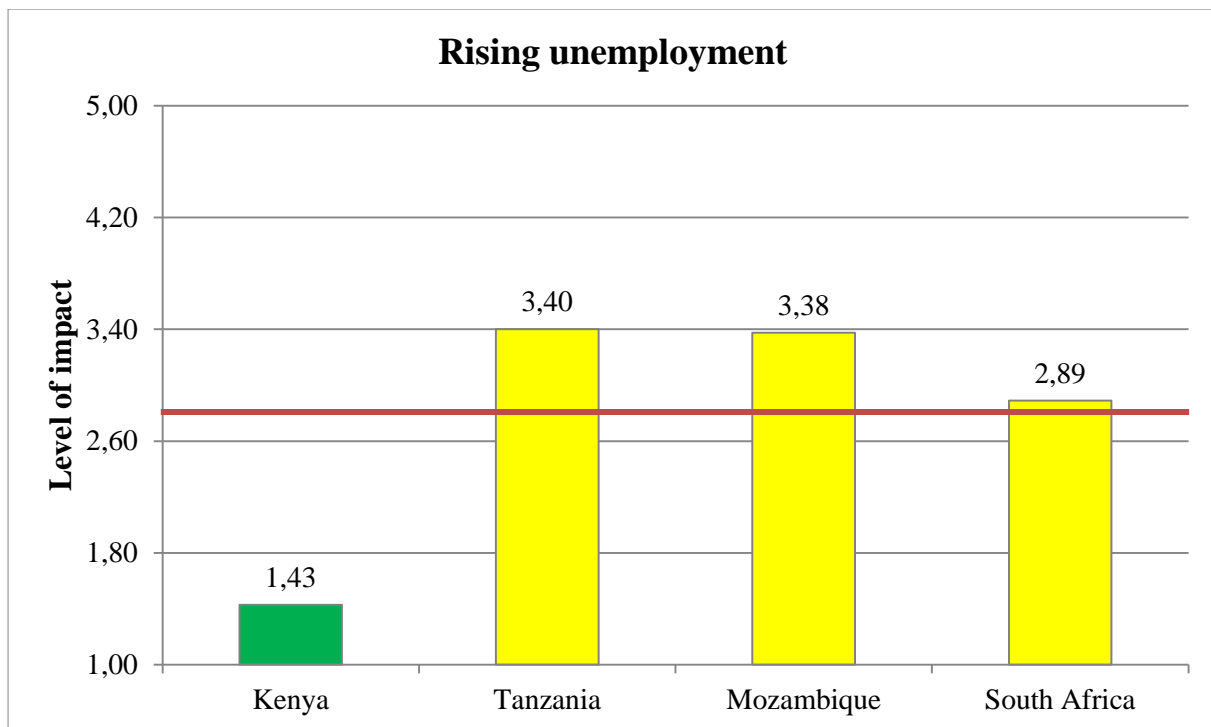


Figure 5.40: Rising unemployment

[Red line indicates the overall mean for Rising unemployment ($M = 2.85$) ($SD = 1.45$)]

d. Increased dependency on marine resources by communities

Figure 5.41 depicts the results for the impact of increased dependency on marine resources by communities. In Tanzania ($M = 3.40$) ($SD = 0.70$), the majority of dive operators perceived increased dependency on marine resources to have a moderate to high impact. Zanzibar Island is where most dive operators perceive this to be a problem, with underlying effects on coral reef ecosystems. This risk is linked to coral reef degradation in many parts of the EAME, as artisanal fishing and extraction of other marine organisms is going unchecked and is difficult to regulate. The researcher's observations at various sites confirm these findings, especially in areas around Zanzibar Island and Inhambane in Mozambique ($M = 3.25$) ($SD = 1.28$). South Africa ($M = 2.00$) ($SD = 1.00$) and Kenya ($M = 1.57$) ($SD = 0.79$) did not report any impact.

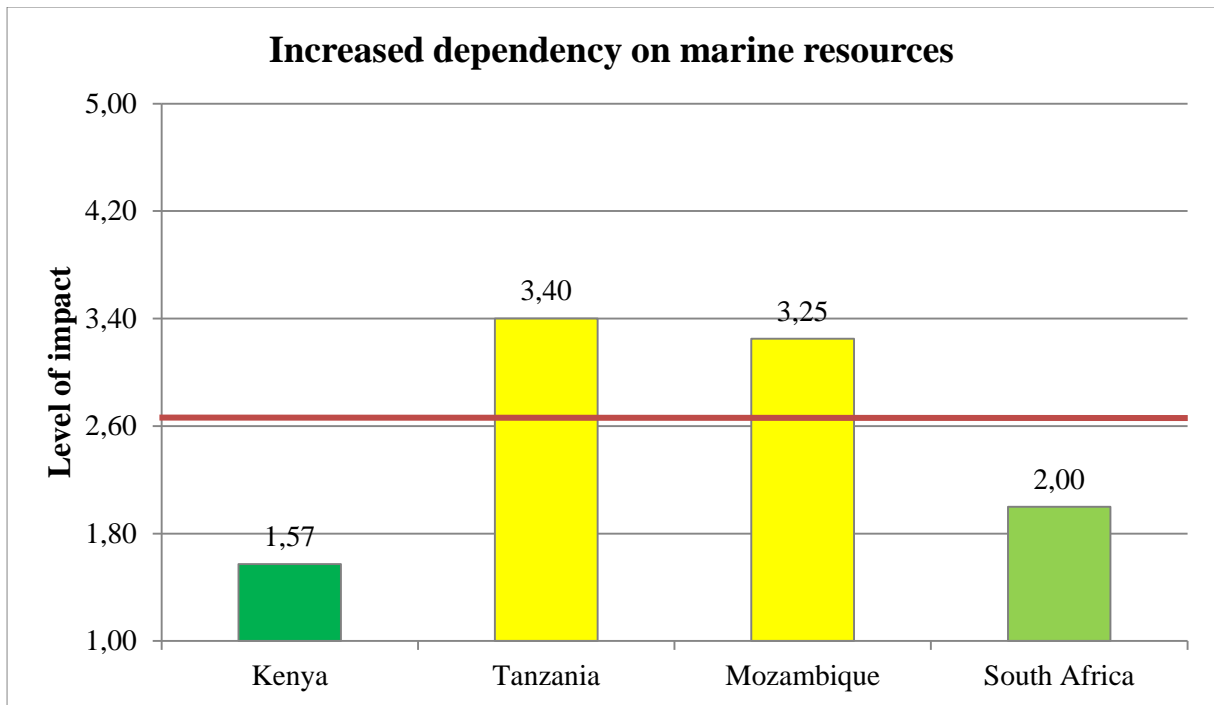


Figure 5.41: Increased dependency on marine resources by communities

[Red line indicates the overall mean for Increased dependency on marine resources (M = 2.62) (SD = 1.21)]

5.10.6. International social risks (ISR)

Figure 5.42 illustrates the radar diagram for the impact of international social risks. International crime stands out as significant for Kenya and Tanzania. Similarly, the impacts of global disease epidemics are high for Tanzania.

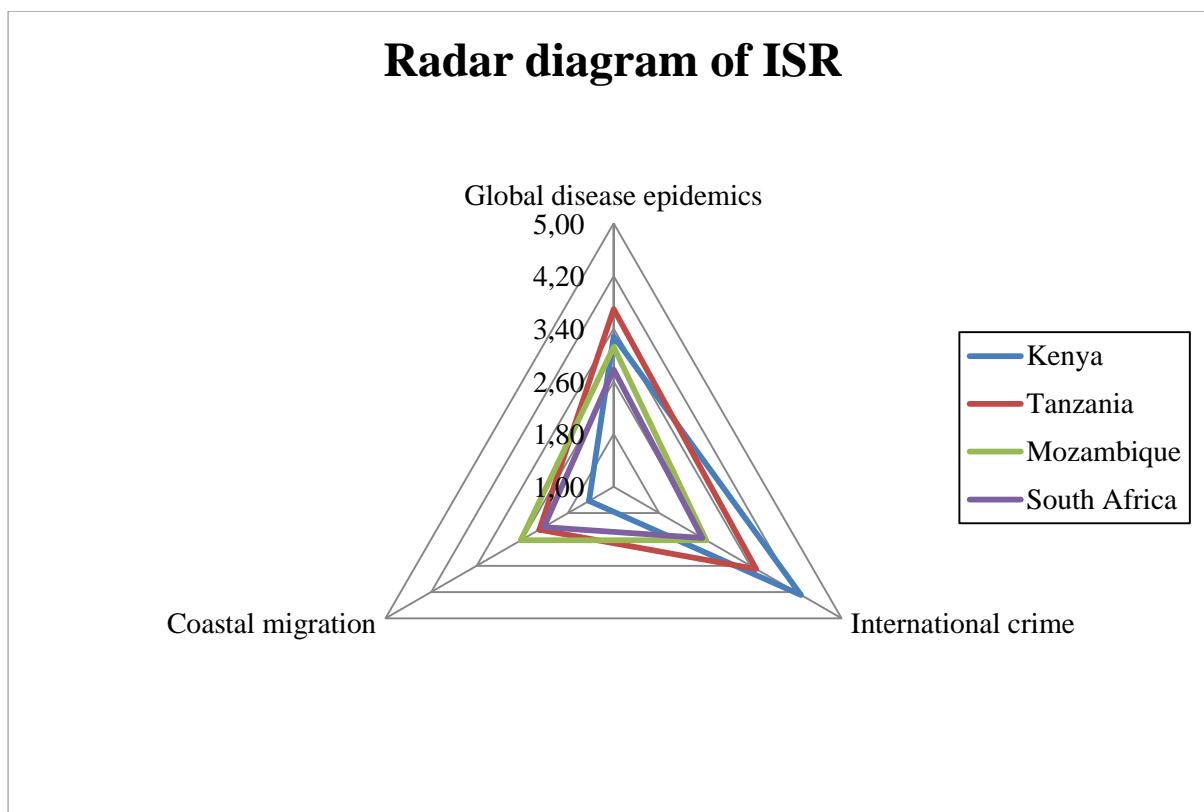


Figure 5.42: Radar diagram for overall international social risks (ISR)

a. Global disease epidemics

Global disease epidemics were ranked highest of all the other international social risks. During the structured interviews it emerged that most dive operators felt that the Ebola virus had had a significant impact on tourism arrivals in 2014 and 2015 (World Bank, 2014; WHO, 2016a) (Section 3.5.3.1). With the majority of dive tourists to Kenya ($M = 3.29$) ($SD = 0.95$) and Tanzania ($M = 3.70$) ($SD = 1.15$) coming from Europe, this had a severe impact, with almost all the dive operators in Tanzania and Kenya being affected by this pandemic. The Zika virus also played its part in 2016, although this was not as severe. For Mozambique ($M = 3.13$) ($SD = 1.36$), dive operators in northern Mozambique rated global disease epidemics as having a high impact, whilst those in southern Mozambique were less affected. One dive operator in southern Mozambique stated during the structured interviews that they are far from West Africa and therefore Ebola had much less of an impact. Additionally, most of their dive tourists are from South Africa and understand that the risk is far afield. South Africa ($M = 2.78$) ($SD = 1.64$) rated this as a moderate risk; nonetheless, dive operators in this area were affected by reduced tourist arrivals as a result of the Ebola virus. Figure 5.43 describes the results for global disease epidemics.

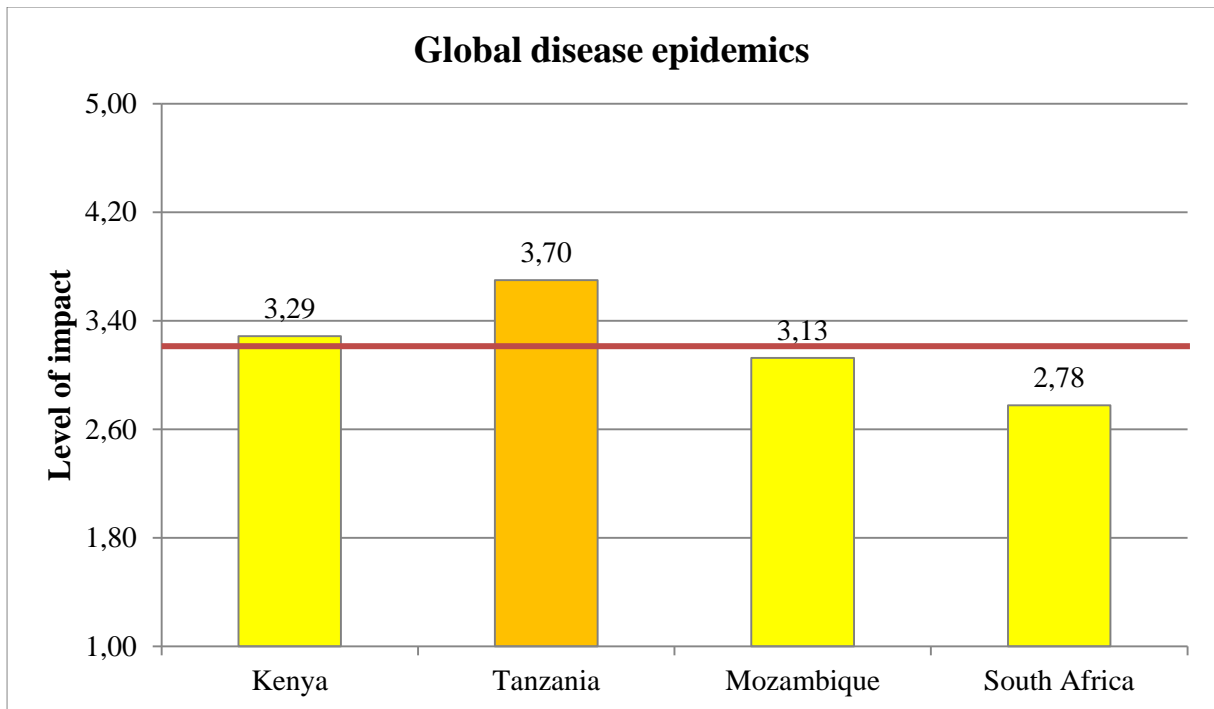


Figure 5.43: Global disease epidemics

[Red line indicates the overall mean for Global disease epidemics (M = 3.24) (SD = 1.30)]

b. International crime

Figure 5.44 illustrates the impact of international crime in East Africa. Terrorism and piracy are the most significant risk to Kenya's (M = 4.29) (SD = 1.11) dive tourism industry, while Tanzania (M = 3.50) (SD = 0.97) also ranks international crime as having a high impact. Those dive operators located in dive tourism hotspots feel that international crime has a high impact to their businesses, specifically in places such as Kenya, and Zanzibar Island. This is mainly due to the reduced tourism resulting from this threat (Baker, 2014; Brown, 2017; CSIS, 2016) (Section 3.5.3.2). The data shows that the scale of international crime as a risk reduces the further south one goes down the East African coast. Mozambique (M = 2.63) (SD = 1.51) sees this as a moderate risk and South Africa (M = 2.56) (SD = 1.67) shows little or no impact.

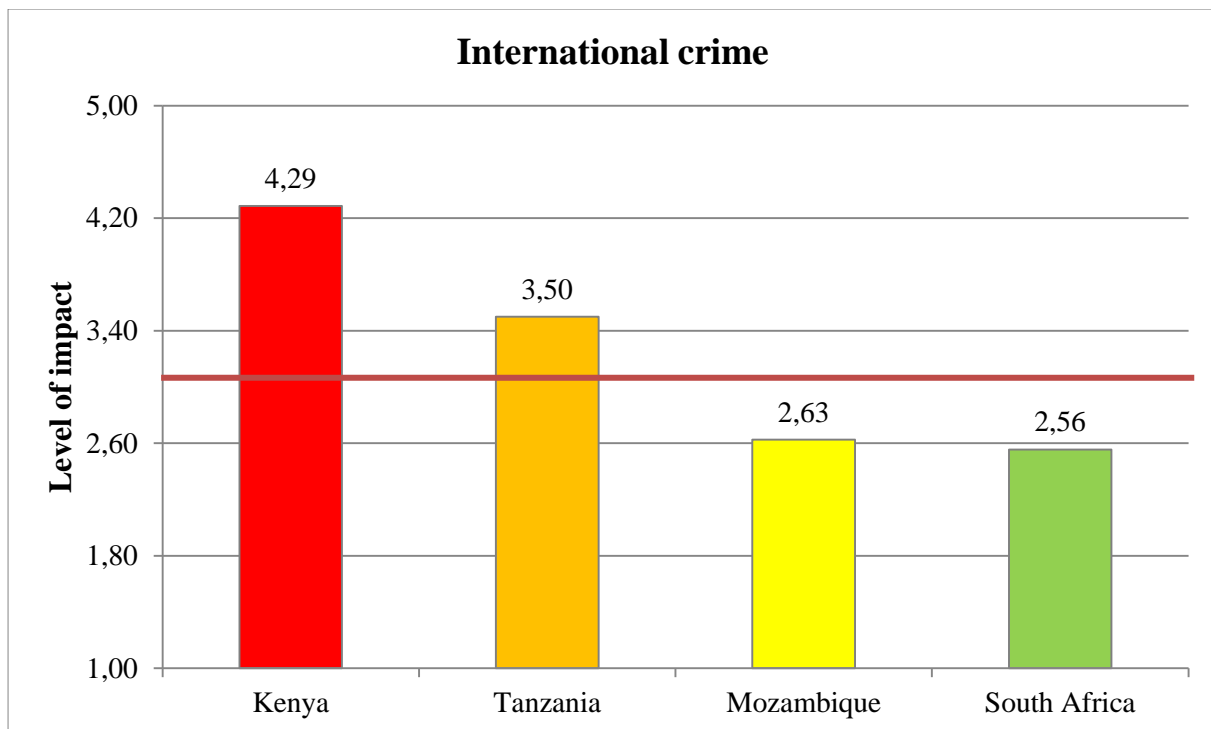


Figure 5.44: International crime

[Red line indicates the overall mean for International crime (M = 3.21) (SD = 1.45)]

c. Coastal migration

Most countries in the EAME do not regard coastal migration as a risk. Tanzania (M = 2.30) (SD = 0.82), South Africa (M = 2.22) (SD = 1.72) and Kenya (M = 1.43) (SD = 0.53) score little or no impact in this regard. Mozambique (M = 2.63) (SD = 1.77) perceives coastal migration to be a moderate risk, with respondents in northern Mozambique (Bazaruto and Vilanculos, Pemba and Memba and Nacala) feeling this to have a high impact, while further south in Ponta d'Ouro it was not perceived to have an impact at all. Figure 5.45 shows the results for coastal migration. With population densities expected to increase along the east coast of Africa over the coming decades there is an expectation that coral reef degradation (Section 3.4.1.1) and domestic social issues will increase (Section 3.4.3.2). With researchers emphasising the magnitude by which coastal migration will impact on ecosystem degradation (Baker, 2014; Corcoran et al., 2010; Richmond, 2011; Tairo, 2015), it is surprising that these countries reported a low impact. However, dive operators have acknowledged that environmental risks are expected to increase in future, as presented in the findings in Section 5.5.2.

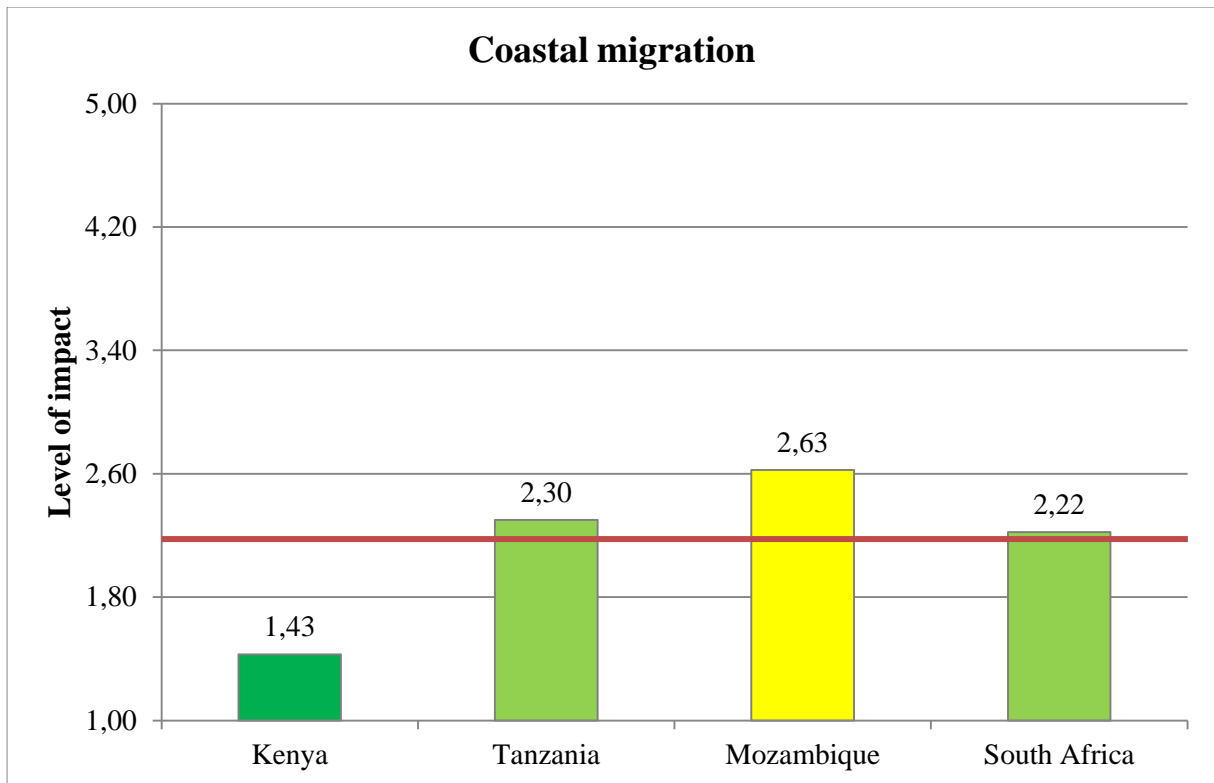


Figure 5.45: Coastal migration

[Red line indicates the overall mean for Coastal migration (M = 2.18) (SD = 1.34)]

5.10.7. Domestic political risks (DPR)

The radar diagram below (Figure 5.46) depicts the results for domestic political risks. These risks show a high prevalence of impact for all countries in the region. Political instability as a risk stands out as having a very high impact on Kenyan dive operators. On the other hand, in South Africa, restrictive MPA regulations pose a significant risk in South Africa, while government corruption has a high impact in Tanzania and Mozambique.

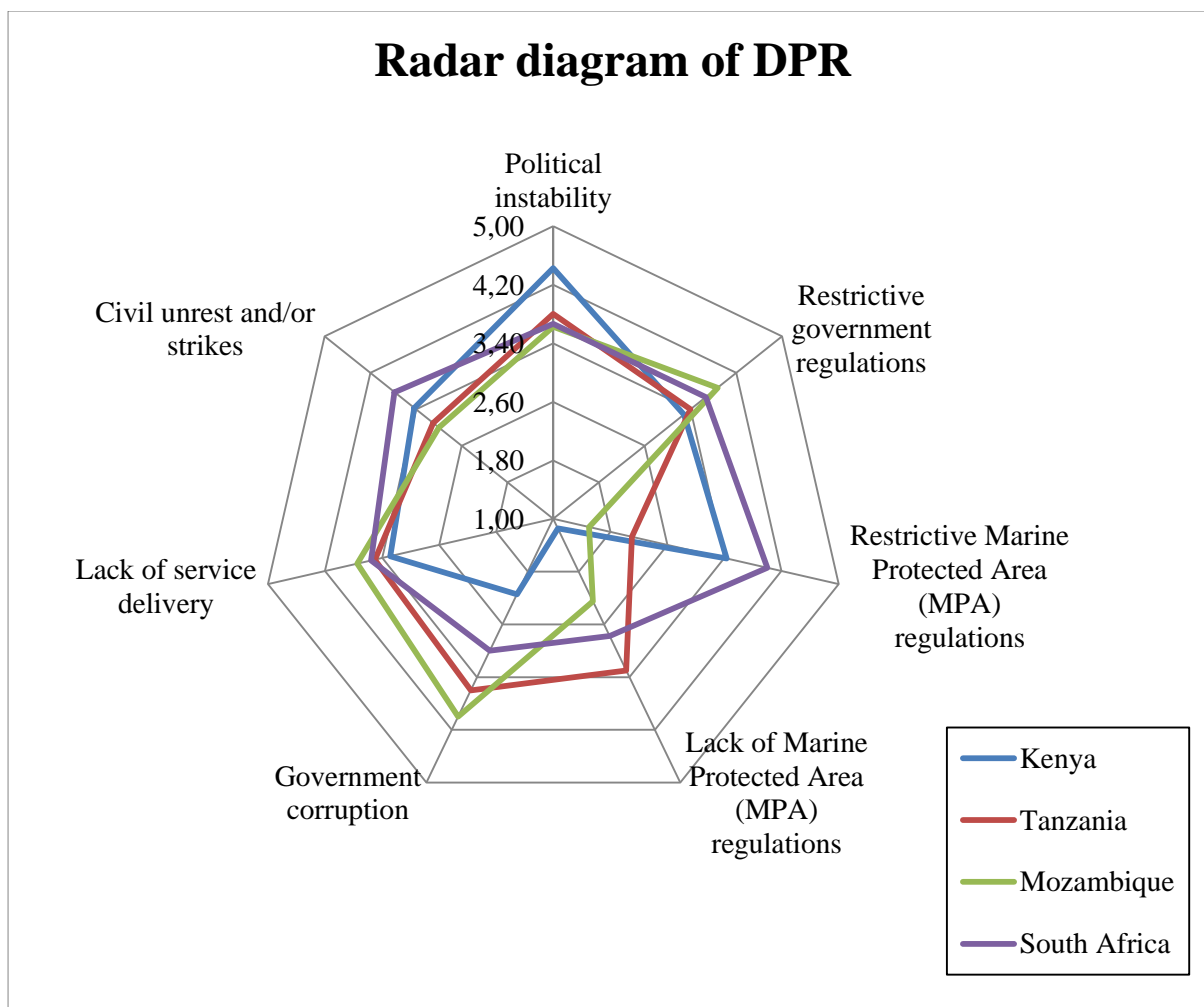


Figure 5.46: Radar diagram for overall domestic political risks (DPR)

a. Political instability

Political instability ranked highest of all risks for Kenya ($M = 4.43$) ($SD = 0.98$) with the highest impact of DPR overall. Recent political violence has ignited fears of a resurgence of the past political instability. The recent 2017 national elections sparked violent riots and protests after the election results were annulled (News24, 2017). All the other countries in the EAME see political instability as having a high impact. This is a significant finding, which reveals the level of impact that political instability and its resulting effects have on the tourism industry. Tanzania ($M = 3.80$) ($SD = 0.63$) was in the process of local elections at the time of the structured interviews in 2015, and the feeling then was that there would be negative implications for businesses as Zanzibar Island (Unguja) was seeking independence from the mainland (WPR, 2016). This potential change was causing uncertainty, which operators feared could negatively affect the number of dive tourist arrivals. South Africa ($M = 3.67$) ($SD = 1.41$) and Mozambique ($M = 3.67$) ($SD = 1.51$) also scored a high impact

in this regard (Section 3.4.4.1). South Africa has been reeling from political turmoil in recent months as allegations of corruption and maladministration plague the current government, specifically after the sitting Finance Minister, Pravin Gordhan, was replaced, and the South African President, Jacob Zuma, survived his eighth no-confidence vote (Fin24, 2017b). Figure 5.47 shows results for political instability.

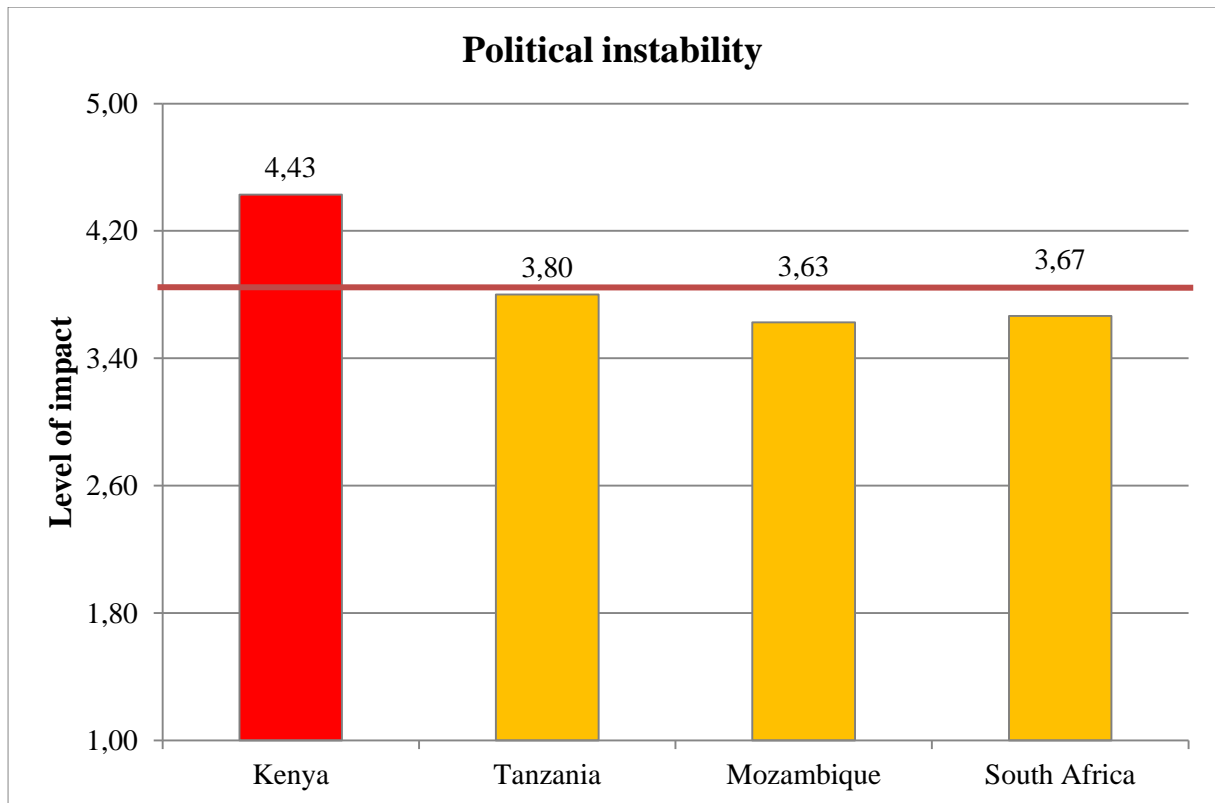


Figure 5.47: Political instability

[Red line indicates the overall mean for Political instability ($M = 3.85$) ($SD = 1.16$)]

b. Restrictive government regulations

Figure 5.48 shows the results for restrictive government regulations. The purpose of including this risk was to highlight the impact that government regulations may have on society, the environment and the tourism industry. Dive operators in Mozambique ($M = 3.88$) ($SD = 1.36$) feel that strict government rules hinder their ability to grow and operate sustainable dive tourism businesses. The researcher, in discussions with dive operators during the structured interviews in 2015, was made aware of the government's inability to make compromises. A similar finding emerged from dive operators in South Africa ($M = 3.67$) ($SD = 1.73$). Tanzania ($M = 3.40$) ($SD = 0.97$) and Kenya ($M = 3.29$) ($SD = 1.11$), who see restrictive government regulations as a moderate risk to their dive operations.

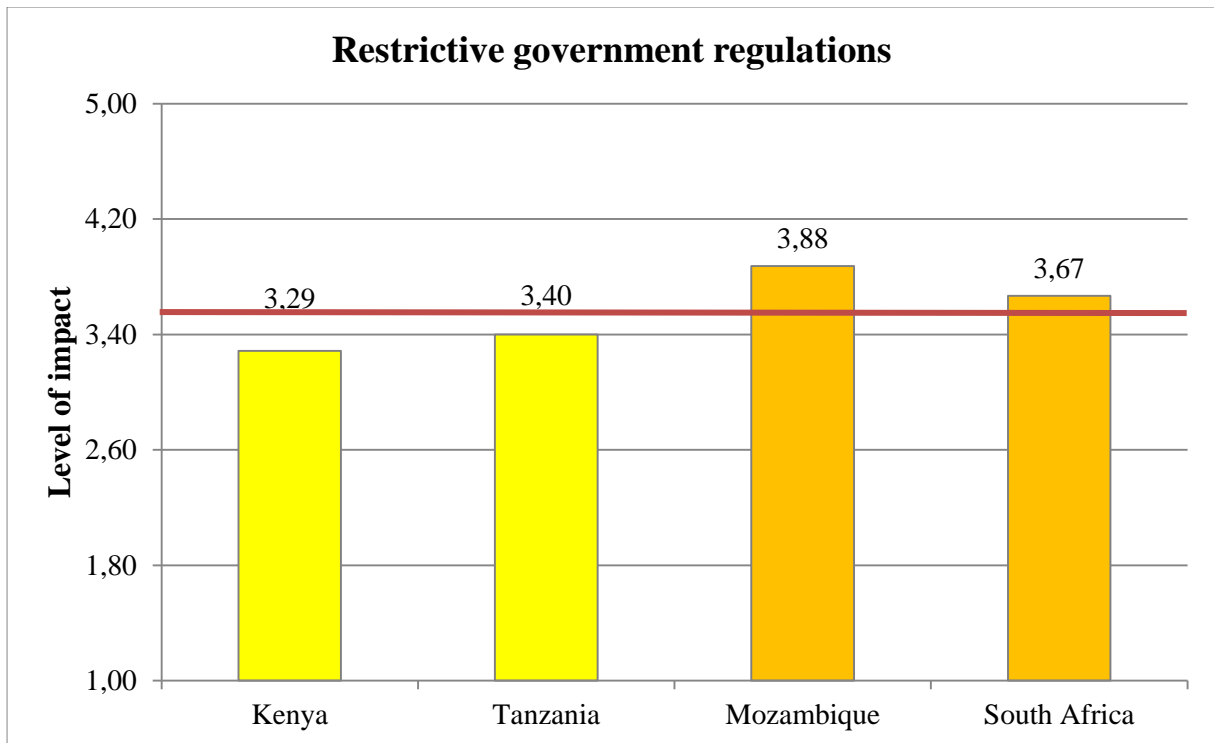


Figure 5.48: Restrictive government regulations

[Red line indicates the overall mean for Restrictive government regulations (M = 3.56) (SD = 1.28)]

c. Lack of service delivery

Dive operators across the EAME feel that a lack of services by local government has a direct impact on their businesses. Mozambique (M = 3.75) (SD = 1.58), South Africa (M = 3.56) (SD = 1.74) and Tanzania (M = 3.50) (SD = 1.18) felt this to be a high impact, while Kenya (M = 3.29) (SD = 0.76) scored a moderate impact. Figure 5.49 shows the results for lack of service delivery. A lack of service delivery often results in strikes and civil unrest, thereby affecting the wider economic communities in surrounding areas (Must and Rustad, 2016).

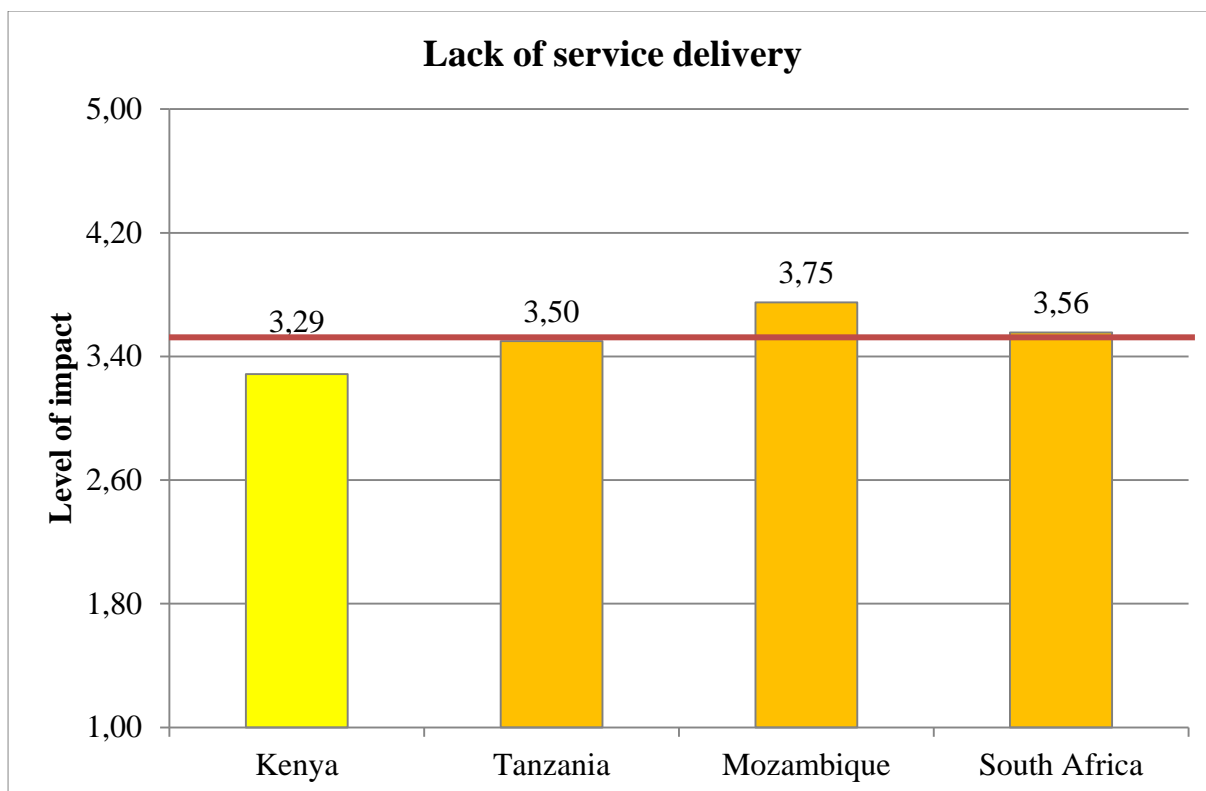


Figure 5.49: Lack of service delivery

[Red line indicates the overall mean for Lack of service delivery (M = 3.53) (SD = 1.33)]

d. Civil unrest and/or strikes

Figure 5.50 illustrates the findings for civil unrest and/strikes. During discussions with dive operators, it was evident that local communities would vent their frustration at local government in response to a lack of basic services such as electricity, water, roads and medical assistance. The results pertained to civil unrest that had had an impact on tourism and the dive operators themselves. South Africa (M = 3.78) (SD = 1.30) and Kenya (M = 3.43) (SD = 1.13) reported a high impact, while Tanzania (M = 3.10) (SD = 1.29) and Mozambique (M = 3.00) (SD = 1.41) reported a moderate impact.

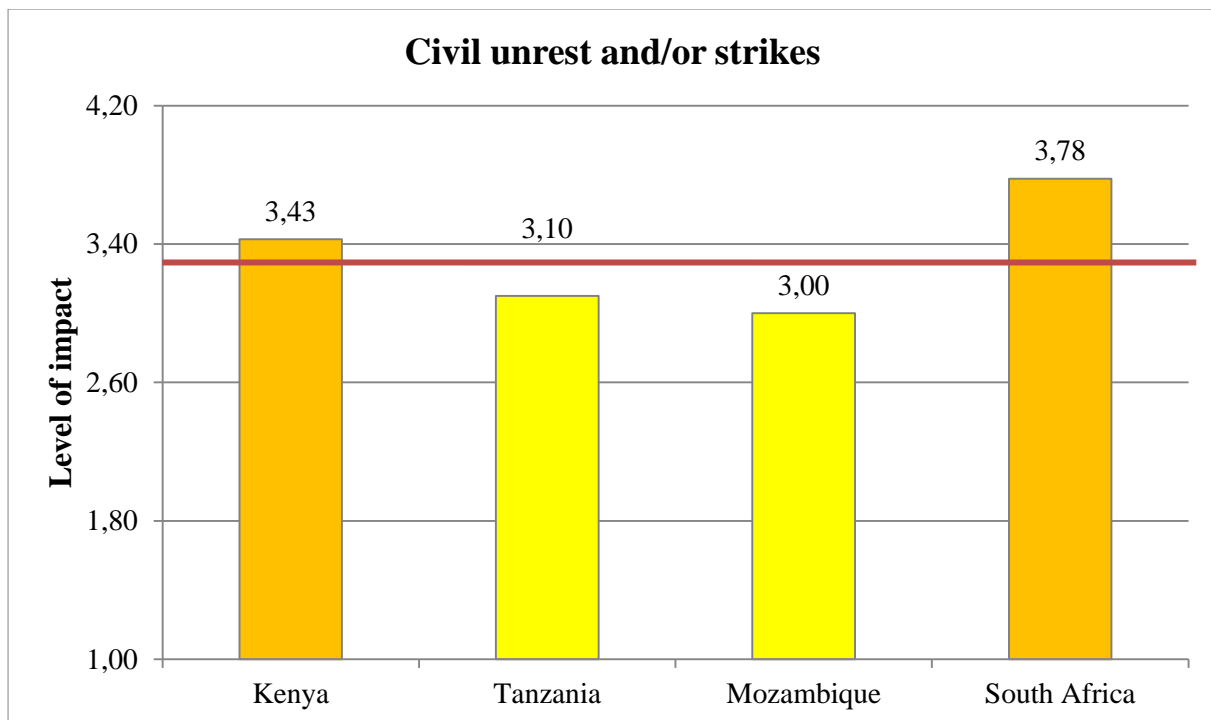


Figure 5.50: Civil unrest and/or strikes

[Red line indicates the overall mean for Civil unrest and/or strikes ($M = 3.32$) ($SD = 1.17$)]

e. Government corruption

Government corruption is seen as having a high impact in Mozambique ($M = 4.00$) ($SD = 1.31$) and Tanzania ($M = 3.60$) ($SD = 1.35$), while South Africa ($M = 3.00$) ($SD = 1.94$) and Kenya ($M = 2.14$) ($SD = 1.07$) regard it as a moderate risk. Governments in the region are seen to be corrupt and dive operators reported that their businesses had suffered in the past as a result. Mozambique and Tanzania seem to have the highest levels of corruption that impact on their dive operations. South Africa is also affected in this regard but at a moderate level. Figure 5.51 shows the results for government corruption.

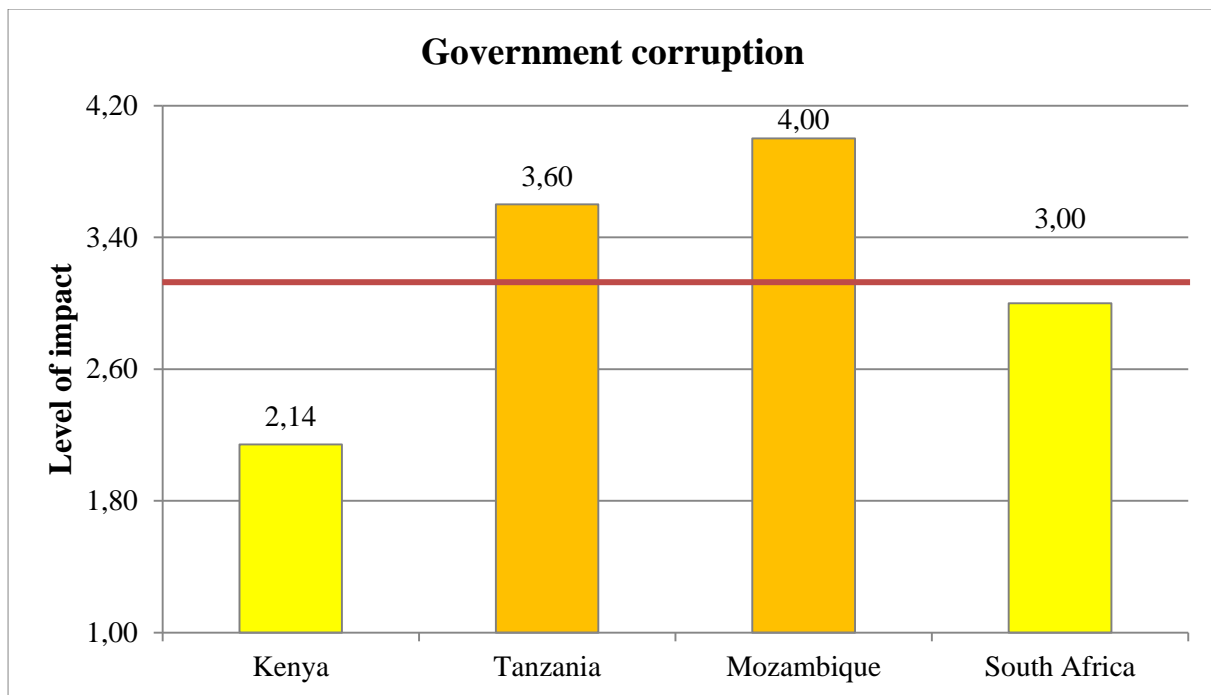


Figure 5.51: Government corruption

[Red line indicates the overall mean for Government corruption (M = 3.24) (SD = 1.56)]

f. Restrictive marine protected area (MPA) regulations

South Africa (M = 4.00) (SD = 1.32) scored the highest for restrictive MPA regulations. In discussions with dive operators in South Africa, it was found that the majority felt that the iSimangaliso Wetland Park Authority (who manage the MPA) has a dictatorial approach when it comes to managing businesses that have permits to conduct business within the park boundaries. From the discussions, it emerged that dive operators feel threatened and are afraid they will be summarily removed from the park by having their permits revoked if they question or do not agree with the iSimangaliso Wetland Park Authority's decisions. This is evidenced by Goble et al. (2014) who affirm that MPAs in South Africa have been fragmented, often with conflicting mandates and agendas. Kenya (M = 3.43) (SD = 1.14) also rates restrictive MPA regulations as a high risk. Tanzania and Mozambique reported low and no risk respectively regarding restrictive MPA regulations. Figure 5.52 shows these results.

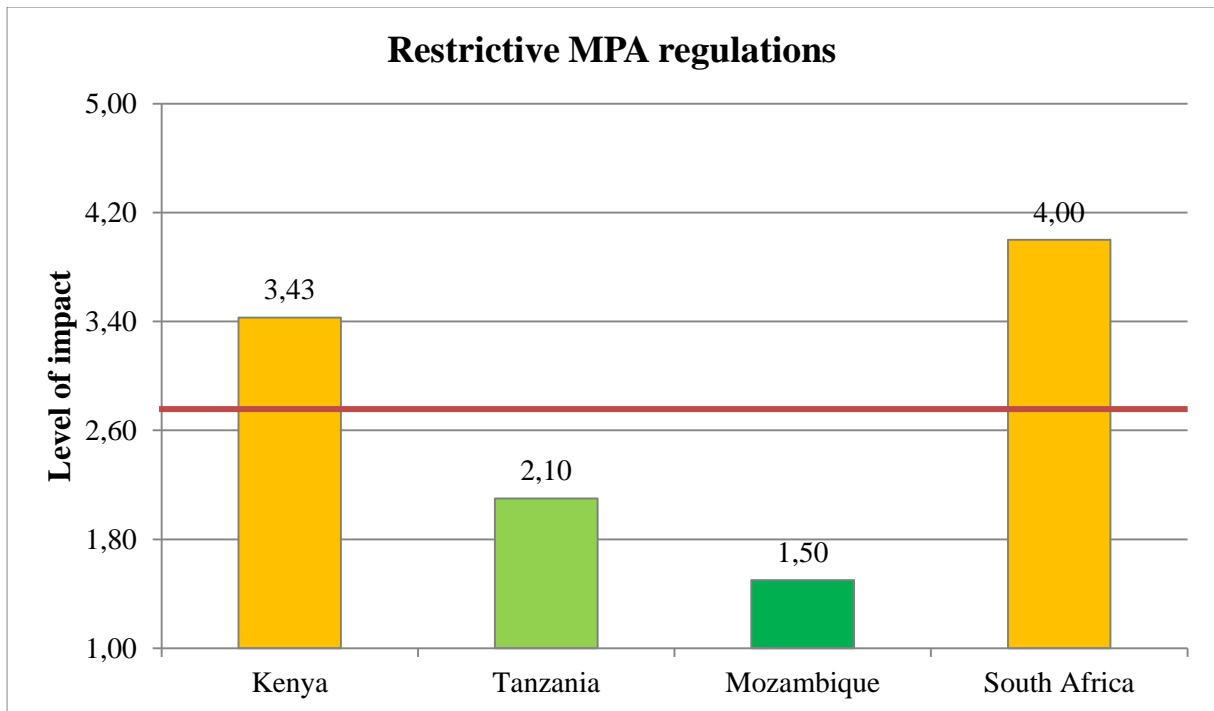


Figure 5.52: Restrictive MPA regulations

[Red line indicates the overall mean for Restrictive MPA regulations ($M = 2.74$) ($SD = 1.66$)]

5.10.8. International political risks (IPR)

Figure 5.53 compares the country results for international political risks. It was found that travel restrictions and strict visa regulations have a significant impact on the region as a whole. However, Kenya is affected most by international political risks, scoring the highest for travel restrictions, neighbouring conflicts and regional political instability.

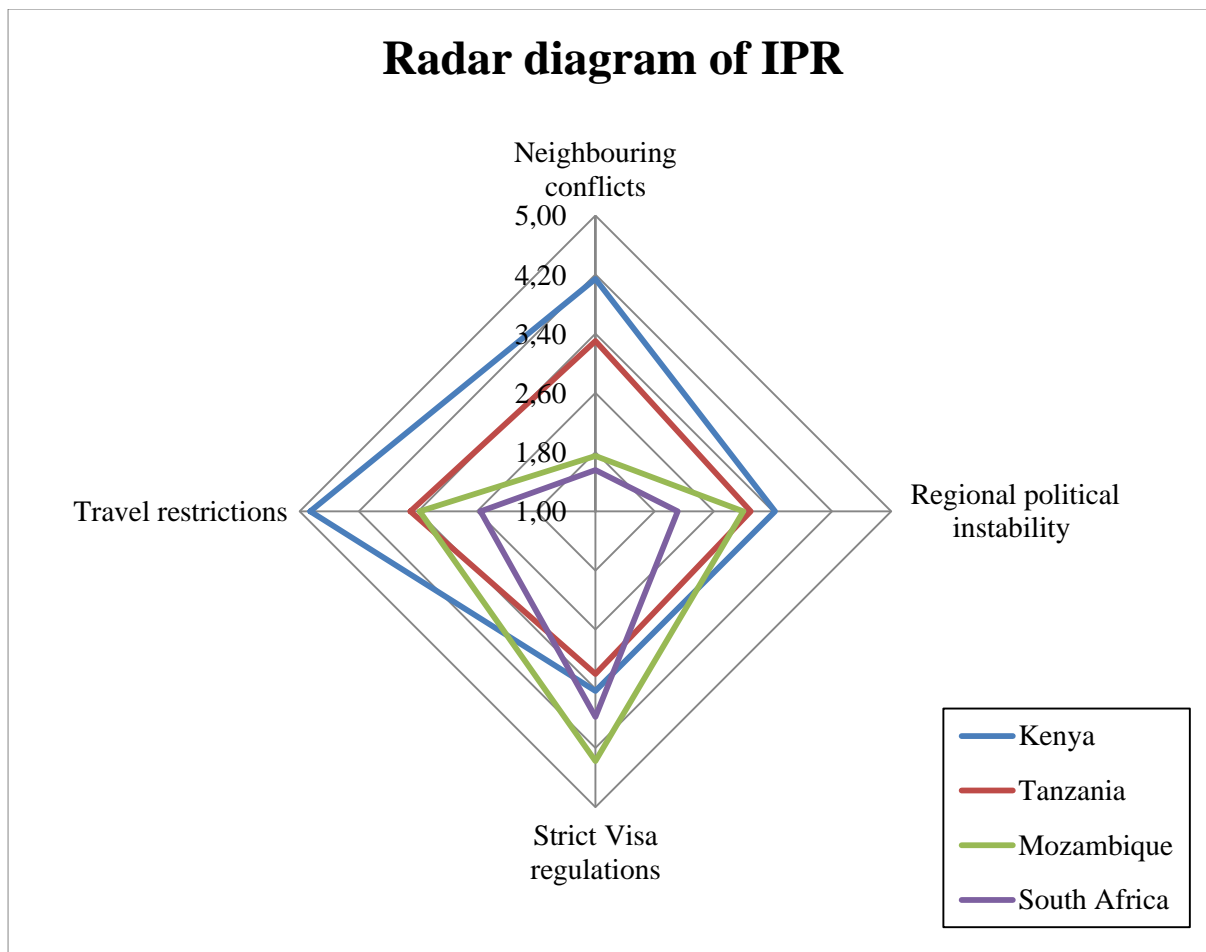


Figure 5.53: Radar diagram for overall International political risks (IPR)

a. Strict Visa regulations

The highest ranked risk for international political risks is strict visa regulations. Most of the dive operators felt that visa regulations are a major obstacle to tourism growth in the industry, as evidenced by Whyte (2009) (Section 3.5.4.2). Dive operators in Mozambique ($M = 4.38$) ($SD = 0.74$) felt that strict visa regulations have a very high impact to their businesses. Bureaucracy at border crossings and lengthy delays in visa application processes restrict access for tourists (AVOR, 2016). South Africa ($M = 3.78$) ($SD = 1.48$) has been affected by the ‘birth certificates for minors’ debacle (Booyesen, 2015; Traveller 24, 2015), however, as most dive tourists are local, the effects were not as great although the issue did have an impact on international tourists. Kenya ($M = 3.43$) ($SD = 0.79$) scores a high impact in this regard, while Tanzania scores a moderate impact ($M = 3.20$) ($SD = 1.23$). Figure 5.54 shows the results for strict visa regulations.

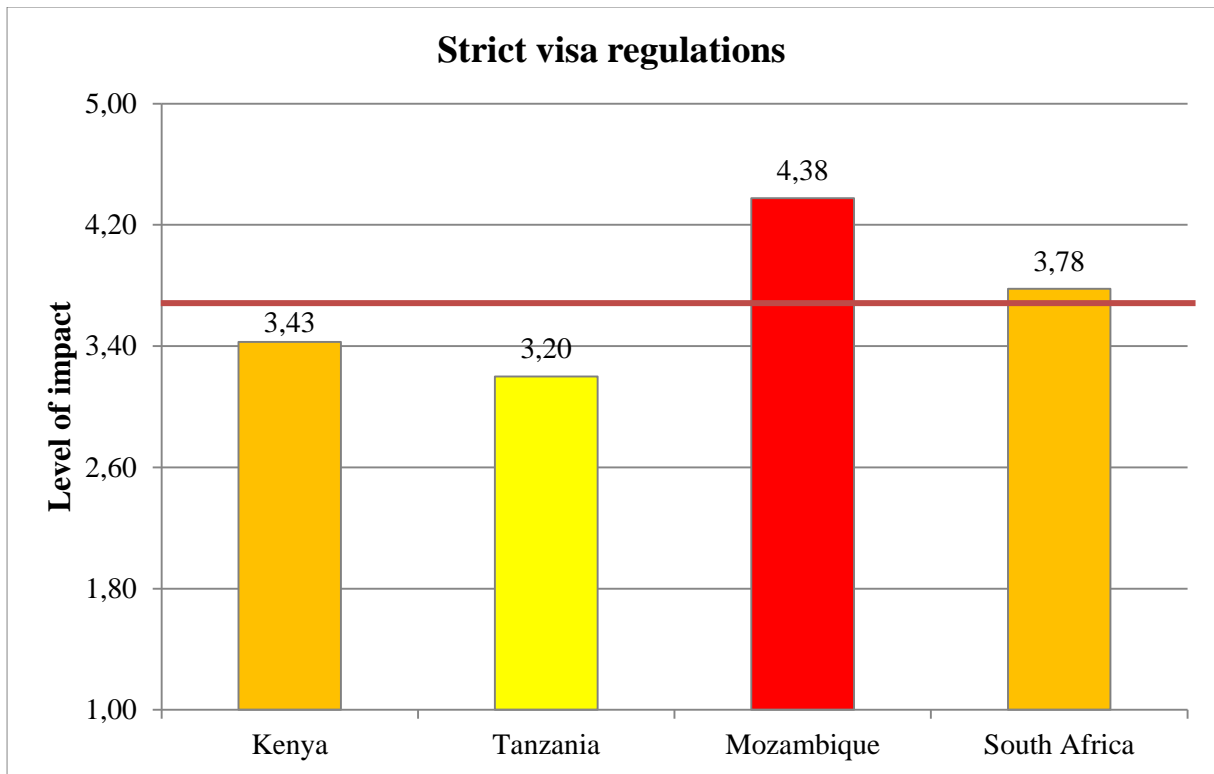


Figure 5.54: Strict visa regulations

[Red line indicates the overall mean for Strict visa regulations (M = 3.68) (SD = 1.17)]

b. Travel restrictions

Travel alerts in terms of which foreign governments impose travel restrictions on countries have a very high impact on Kenya (M = 4.86) (SD = 0.38) and is the highest political risk. This results when travel advisories are issued as a result of continued terrorism threats and incidents in the country (European Commission Consular Protection, 2017; Government of Canada, 2017; UK Foreign and Commonwealth Office, 2017; US Passports and International Travel, 2017) (Section 3.5.4.2). The terrorist acts carried out over the past few years by al-Shabaab, including the hijacking of foreign nationals, has prompted governments to impose strong warnings against travelling to areas in and around Kenya (News24, 2016; News24, 2017). Tanzania (M = 3.50) (SD = 1.58) also experienced a high impact in this regard as a result of conflict in neighbouring Kenya. Mozambique (M = 3.38) experienced a moderate impact while South Africa (M = 2.56) (SD = 1.67) reflects a low impact. This is because the further south one travels in the EAME, the less exposure there is to terrorism and international crime. Northern Mozambique, however, suffers from political instability. Figure 5.55 shows the results for travel restrictions.

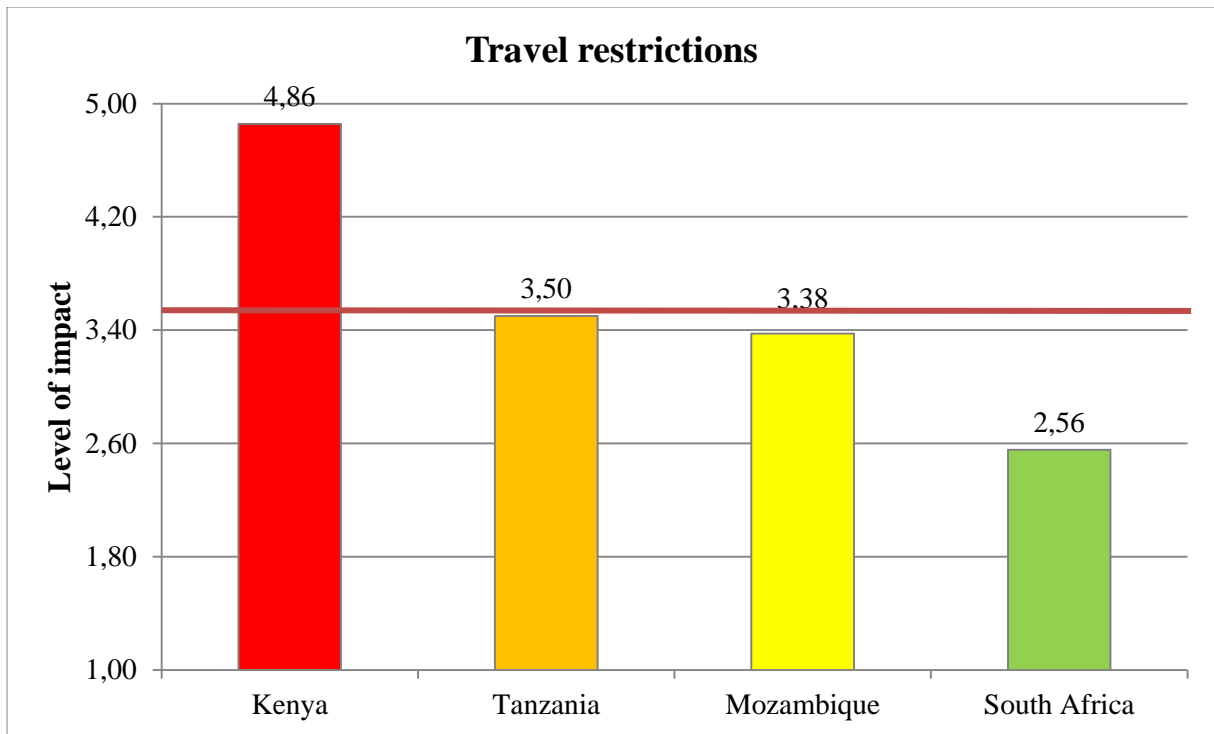


Figure 5.55: Travel restrictions

[Red line indicates the overall mean for Travel restrictions (M = 3.50) (SD = 1.54)]

c. Regional political instability

Kenya (M = 3.43) (SD = 1.40) has been more exposed to regional political instability than the other EAME countries, as expressed in the results obtained for ‘neighbouring conflicts’ (d) and ‘travel restrictions’ (b) risks. Tanzania (M = 3.10) (SD = 0.74) and Mozambique (M = 3.00) (SD = 1.31) expressed a moderate risk of regional political instability, while South Africa (M = 2.11) (SD = 1.05) shows a low impact. Figure 5.56 depicts these results.

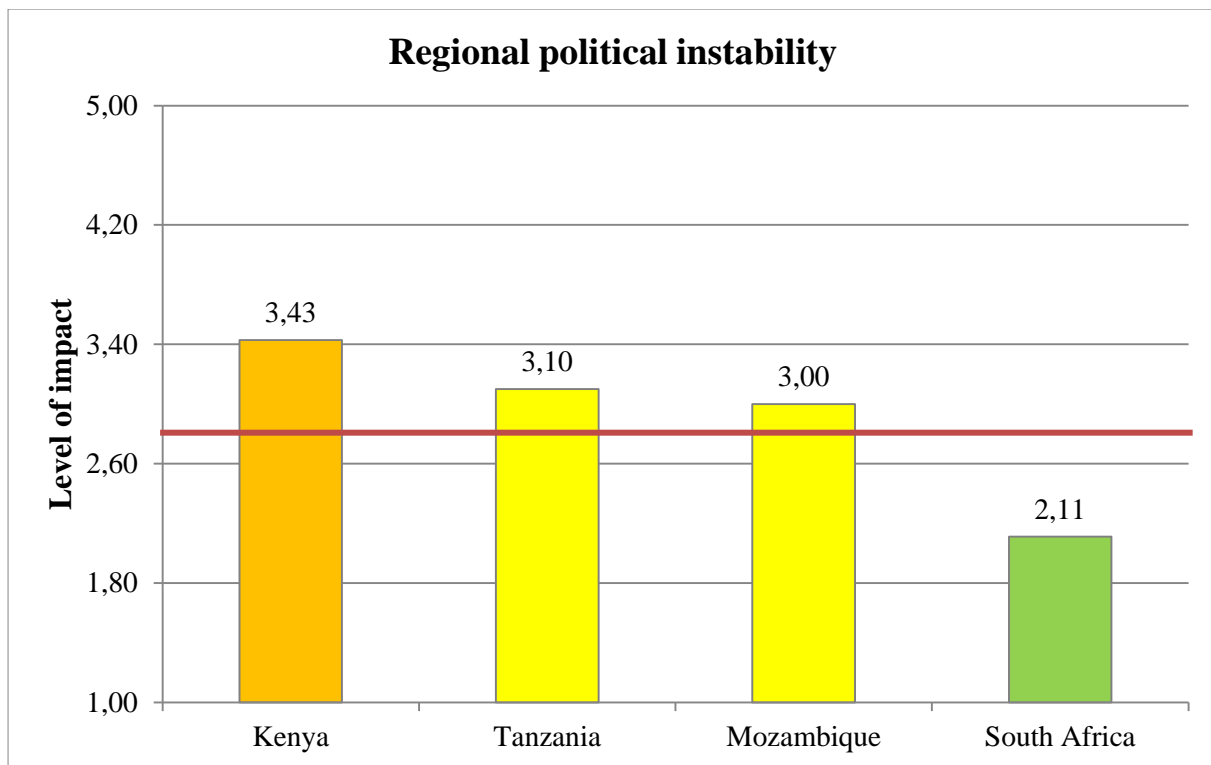


Figure 5.56: Regional political instability

[Red line indicates the overall mean for Regional political instability (M = 2.88) (SD = 1.17)]

d. Neighbouring conflicts

Figure 5.57 shows the results for neighbouring conflicts. Kenya (M = 4.14) (SD = 1.46) expressed a high impact with regard to neighbouring conflicts. This is the result of links with al-Shabaab and terrorism (Ansorg, 2014) (Section 3.5.4.1). Tanzania (M = 3.30) (SD = 0.67) has also been affected from a regional perspective. Meanwhile, Mozambique and South Africa report neighbouring conflicts to have little or no impact on dive operators.

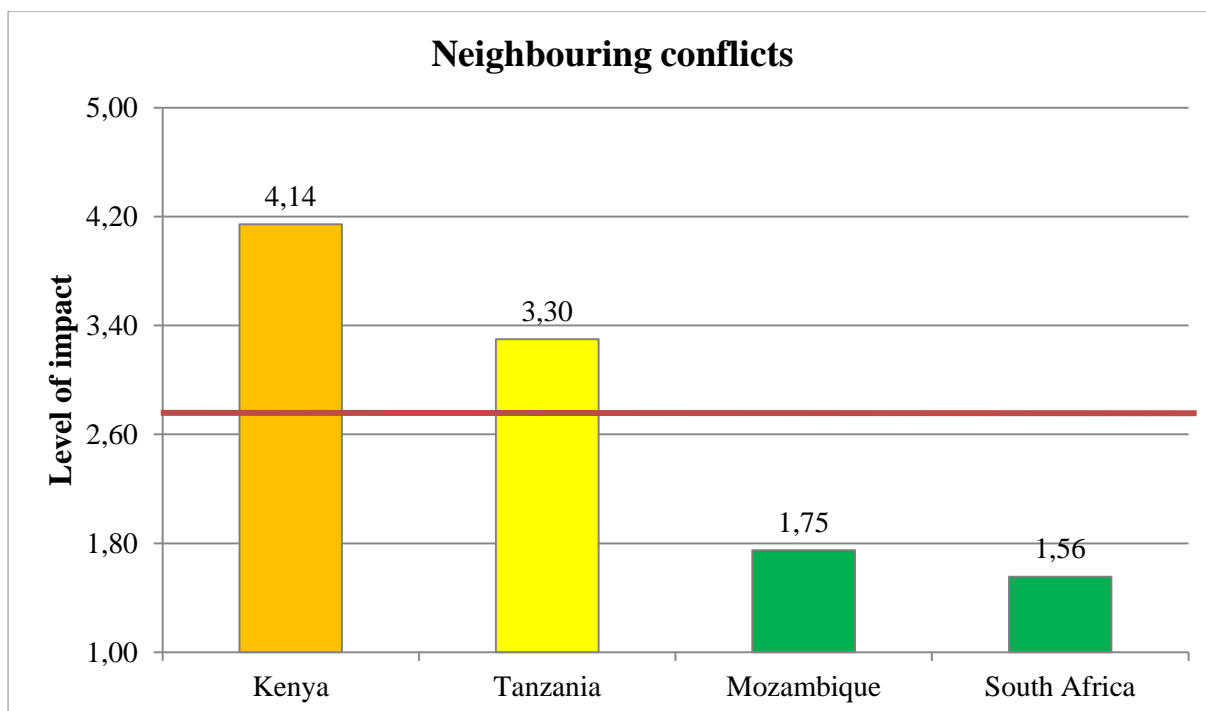


Figure 5.57: Neighbouring conflicts

[Red line indicates the overall mean for Neighbouring conflicts (M = 2.65) (SD = 1.39)]






5.11. SUMMARY OF CROSS-CASE ANALYSIS (PART B)

This section provides a summary of the comparison of the individual external risks experienced by countries in the EAME (Kenya, Tanzania, Mozambique and South Africa). The aim of using a cross-case analysis was to make comparisons between the different countries. The main reason for this approach was to highlight that while the external risks that were identified have some form of relevance to all countries, each country and region within that country has specific reasons why those risks may have a higher impact than others. It was therefore important for the researcher to draw inferences from these findings and to make these comparisons. In addition, this added more weight to the findings, and allowed for a much more thorough investigation of the results, prompting a discussion of the individual risks within each of the risk categories. Table 5.19 provides the overall mean results of the risk categories by country. As is evident, the table shows that the majority of these risk categories hold a moderate risk.

Table 5.19: Overall mean results of external risk categories by country comparison (colour codes as per Table 5.25)

	Kenya	Tanzania	Mozambique	South Africa	Overall Mean
Direct Environmental Risks (DER)	1.90	2.87	2.06	1.63	2.15
Indirect Environmental Risks (IER)	1.51	2.57	2.02	1.79	2.02
Environmental Risk Mean Total					2.09
Domestic Economic Risks (DEcR)	2.77	3.02	3.35	3.73	3.24
International Economic Risks (IEcR)	2.57	3.40	3.53	3.71	3.34
Economic Risk Mean Total					3.29
Domestic Social Risks (DSR)	1.57	3.12	3.40	2.82	2.79
International Social Risks (ISR)	3.00	3.17	2.79	2.52	2.87
Social Risk Mean Total					2.83
Domestic Political Risks (DPR)	3.02	3.25	3.14	3.49	3.24
International Political Risks (IPR)	3.04	3.23	2.84	2.56	2.92
Political Risk Mean Total					3.08
Overall Mean Total by Country	19.38/8 = 2.42	24.63/8 = 3.07	23.13/8 = 2.89	22.25/8 = 2.78	2.82

Key:

	No impact		Low impact
	Moderate impact		High impact
	Very high impact		

5.11.1 Kenya

Dive operators in Kenya scored low means for environmental risks (both for DER and IER). When it comes to DEcR, however, they feel that price inflation and increasing interest rates have an impact on their businesses. For IEcR, economic recessions and financial crises have had a knock-on effect on the Kenyan economy but are surprisingly not considered to have a high impact on dive operators in the country. Although DSR is low, ISR is considered to be of most concern for Kenya's dive operators. Terrorism has severely affected tourism in the region, forcing dive operators to question their future. Political instability holds the highest risk of the DPRs, which are closely linked to restrictive government and MPA regulations, which dive operators feel are barriers to sustainable growth.

5.11.2 Tanzania

Dive operators in Tanzania feel that overfishing and destructive fishing (DER) have a very high impact on their businesses. Of the indirect environmental risks (IER), coral bleaching and marine pollution (plastics, marine debris, etc.) revealed high means. For DEcR, the economic impact of coral reef degradation is more of a concern to Tanzanian dive operators than any of the other countries, along with price inflation. Economic recessions, financial crises and price competitiveness score highly for IEcR. Crime and unemployment are a concern for DSR, as are global disease epidemics and international crime for ISR. For DPR, political instability, lack of service delivery and government corruption stand out, while for IPR travel restrictions are a concern.

5.11.3 Mozambique

For DER, overfishing, destructive fishing and marine pollution are on the rise but are not of great concern for dive operators in Mozambique. Similarly, IER is perceived to have a low impact. Domestic economic risks (DEcR) have a high impact in relation to price inflation and high fuel prices and are perceived to lead to depressed local economic activity. Economic recessions, financial crises and dive tourist accessibility have a high impact with regard to international economic risks (IEcR). For domestic social risks (DSR), population growth along the coast has a high impact, correlating with rising unemployment, crime and increasing dependency on marine resources. ISR does not stand out, however global disease epidemics did impact on dive tourism numbers when the Ebola virus pandemic was at its peak. For DPR, government corruption, restrictive government regulations, lack of service

delivery and political instability have severe effects on dive operators' businesses. For IPR, strict visa regulations have a very high impact.

5.11.4 South Africa

Environmental risks (direct and indirect) have little or no impact on South African dive operators given the pristine conditions of the natural environment, which is managed by the iSimangaliso Wetland Park Authority. Domestic economic risks (DEcR), however, scored the highest means of all other countries in the EAME. Price inflation, depressed local economic activity and high fuel prices scored a very high impact, with increasing interest rates scoring a high impact. Dive tourist accessibility scored as a very high impact for international economic risks (IEcR), whereas economic recessions, financial crises and price competitiveness have high impacts. For DSR, domestic crime has a high impact. Political instability, restrictive government regulations, lack of service delivery and civil unrest and/or strikes emerged as having high impacts. Surprisingly, government corruption only scored as having a moderate impact. Restrictive MPA regulations scored highest for dive operators in South Africa. The only IPR that was a concern was strict visa regulations, given that the South African government had at the time imposed new regulations for international visitors which restricted travel due to cumbersome visa processes.

5.11.5 Overall conclusion for cross-case analysis

Overall, the results showed that Tanzania has the highest impact of external risks on dive operators' businesses ($M = 3.07$) (Table 5.56). Where Tanzania scored higher than other countries was in both direct and indirect environmental risks and international political risks, while Mozambique scored higher than other countries in domestic social risks. Mozambique does have problems in dealing with domestic political risks, which have been a cause of concern. Kenya did not score higher than any other countries in any of the risk categories but did place domestic and international political risks high on its level of impacts. Overall results for South Africa indicate that domestic and international economic risks are ranked as high to very high impact, as are domestic political risks. In summary, the region ranked the external risks identified as having a moderate impact, but individually each country has specific factors that tell their own story, as the findings have addressed.

5.12. CONCLUSION

Chapter 5 looked at the overall results obtained from the data. The results were presented in a structured way for easy interpretation. Part A consisted of biographical information and the overall results and rankings pertaining to external risks. The biographical information was presented first and included a description of dive operators in East Africa; the number of years they have been in operation; income generated from scuba diving activities; scuba diving activities on coral reefs; location proximity to coral reefs; and dive tourist country of origin. This was followed by a brief discussion of the overall results and ranking of the external risk categories. In this section each of the individual external risks were assessed based on the mean scores obtained from the data in order to rank them. An exploratory factor analysis and Kendall's tau_b (τ) test were conducted and discussed so as to highlight key differences and correlations of factors between risk categories.

Part B consisted of a cross-case analysis of all direct/domestic and indirect/international risks which were above a certain threshold. This analysis afforded the researcher an opportunity to delve deeper into the data so as to compare it by country and to make inferences about the key differences between the external risks in different regions of the EAME.

The following chapter, Chapter 6, discusses the way in which the primary and secondary research objectives for this study have been achieved in order to conclude the study.

CHAPTER 6

CONCLUSION TO THE STUDY

6.1. INTRODUCTION

Chapter 6 provides a summary of the overall results gleaned from the data collected to provide a comprehensive conclusion on the impact that external risks have on dive operators in the EAME. This chapter will demonstrate how the primary and secondary research objectives have been achieved, and how this achievement, in turn, addresses the research problem. In Section 6.2, the achievement of each secondary research objective is discussed. The contributions of this research are then highlighted in Section 6.3. The chapter will conclude with a brief discussion on the limitations of the study (Section 6.4) and suggestions for further research (Section 6.5).

6.2. ACHIEVEMENT OF RESEARCH OBJECTIVES

Scuba diving forms a key component of the marine tourism system and research suggests that external risks are having an impact on the future of SDT in the EAME. Dive tourism (which is a form of marine tourism) continues to be one of the fastest growing sectors in the tourism industry, however the future of exotic tourism destinations has come under threat as a result of environmental, social, political and economic risks. The dive tourism industry is coming under increasing pressure as a result of international risks such as terrorism, global disease epidemics and economic recessions. Similarly, domestic risks occurring within the borders of countries in the EAME, such as increasing levels of crime, political instability, and degradation of the marine environment, also threaten the dive industry. These external risks are not only impacting on the sustainability of the scuba diving industry, but are also expected to affect the marine tourism industry as a whole. With this in mind, research was undertaken to achieve the primary research objective of the study, namely, to identify and assess the external risks that have an impact on the scuba diving industry in the East African Marine Ecoregion (EAME). The analysis of results (in Chapter 5) offered a comprehensive overview of the findings that informed the objectives of this study. The secondary research objectives were a means to achieve the primary research objective, and by so doing to solve the research problem. The overall results of the secondary research objectives are summarised below to demonstrate their achievement. Where relevant, practical guidelines are

provided. *All practical guidelines are indicated in italics.* This is followed by a brief reference back to the research problem and how it has been addressed.

6.2.1. Secondary research objective 1

- To identify the scuba diving operators in the EAME and their scope of operation

These results were presented in Sections 4.3 and 5.2.1. Seventy-seven dive operators were identified along the east coast of Africa. These dive operators fall within the EAME, which was identified as the geographical scope for the purposes of this study. Of the 77 dive operators identified by the researcher, most dive operators are located in Tanzania (30). Mozambique has the second largest number of dive operators (24), while South Africa has 14 and Kenya hosts nine. The dive operators were located by searching various online sources and travel and scuba diving magazines. From the primary data gathered by the structured survey, it emerged that 97% of dive operators operate within or nearby marine protected areas (MPAs), suggesting that MPAs and marine reserves form a vital element for the sustainability of the dive tourism industry through the enforcement and protection of marine reserves. Thus, there is a direct correlation between a dive operator's business location and the geographical range of an MPA.

The geographical distribution of coral reefs along the EAME is also a key consideration to the location of dive operators. This is supported by the findings that 73.5% of a dive operator's scuba diving activities occur on coral reefs. Similarly, over 70% of dive operators' incomes in the region are generated from coral reefs. This is also linked to the number of years that dive operators have been in business. It was found that 76.47% of dive operators had been in operation for over ten years.

The location of dive operators with access to protected coral reefs in terms of their proximity to MPAs/marine reserves (97%) indicates that MPAs are an important consideration for the longevity of dive tourism businesses in the EAME. From the information gathered it is clear that a geographical location containing pristine coral reefs and well-protected marine ecosystems is a vital component of a scuba diving operator's long-term viability as a business concern. The results also show that dive operators' main form of income is derived from scuba diving activities, thereby attesting to the fact that well-protected and pristine coral reefs are a key component of a dive operator's business success. It is also important to acknowledge that dive operators are highly dependent on dive tourists from various parts of

the world to sustain their businesses. Close to 80% of dive tourists who travel to the region are from overseas, thus indicating the dependency of the EAME dive tourism industry on foreign tourists. By identifying the dive operator's location; determining how many years they have been in operation; determining the percentage of income derived from scuba diving activities; determining the percentage of scuba diving activities occurring on coral reefs; determining the proximity to marine protected areas/marine reserves; and the origin of scuba diving tourists, secondary research objective 1 has been achieved.

6.2.2. Secondary research objective 2

- To determine the external risks most relevant to dive operators in the EAME and assess their level of impact

The results were presented in Section 5.3, which offers a comprehensive analysis of the impacts that each individual risk may have on scuba diving businesses in the EAME. The individual risks which were identified were grouped into risk categories. In summary, in the EAME overfishing and marine pollution have the highest impact with respect to environmental risks, price inflation and economic recessions have the highest impact in terms of economic risks, and international crime and global disease epidemics form the social risks with the highest impact. Meanwhile, political instability and strict visa regulations have the highest impact as far as political risks are concerned. Table 6.2 below provides an overview of the risks perceived to have the greatest impacts on dive operators' businesses in the EAME. The table indicates the greatest risks per country (the columns) as well as the most significant individual risk within each risk category (the rows). However, this is preceded by Table 6.1 in order to remind the reader of the colour coding which describes the level of impact according to the Likert scale.

The highest risks for **direct environmental risks (DER)** are overfishing ($M = 4.30$) and destructive fishing ($M = 4.30$). Given that the overall mean is 2.15, these risks are significant in Tanzania and Mozambique. For **indirect environmental risks (IER)** ($M = 2.02$), coral bleaching ($M = 3.40$) was considered to have the highest impact in Tanzania. Overall IER scores the lowest out of all the risk categories in this study. Dive operators feel that in future, environmental risks will have a much more profound impact on the destination image which is so crucial in attracting dive tourists to the region. Planning for sustainable dive tourism is essential if dive operators are to continue operating in future.

The results for **domestic economic risks (DEcR)** ($M = 3.24$) indicate that price inflation ($M = 4.56$) has a very high impact for dive operators in South Africa. Price inflation is also a very prominent risk in Kenya and Tanzania, whereas Mozambique scored a high impact for depressed local economic activity and high fuel prices. **International economic risks (IEcR)** have the highest overall impact out of all identified risk categories in the EAME ($M = 3.34$). Dive tourist accessibility ($M = 4.33$) has the highest impact on dive operators for IEcR, particularly for South Africa. Overall, IEcR is more significant to dive operators than all other risk categories, indicating their reliance on the global economy as it determines to a greater degree the viability of their dive operations. This is in line with the origin of dive tourists, most of whom are from Europe (28.07%). In total, 79.82% of dive tourists who travel to the EAME are from overseas destinations, reaffirming the inter-dependency of the international economic climate.

The overall mean for **domestic social risks (DSR)** is 2.79, with the highest impact being population growth along the coast ($M = 4.13$). This is perceived to be a high risk in Mozambique. With a growing coastal population, the demand for employment increases, leading to social issues such as greater dependency on natural resources, unemployment, and ultimately crime. **International social risks (ISR)** ($M = 2.87$) are ranked as a moderate impact overall, however, there are regional occurrences which have a high impact on certain countries in the EAME. The Kenyan tourism economy has endured prolonged terrorism incidents greatly affecting international visitor numbers to the country.

Political instability ($M = 4.43$) ranks as the highest risk for **domestic political risks (DPR)** ($M = 3.24$). Political instability ranks as the most common DPR risk category and is considered a very important indicator of risk for dive operators in all countries in the EAME. Kenya scores the highest in political instability ($M = 4.43$). Restrictive MPA regulations are considered as a very high risk in South Africa. For **international political risks (IPR)**, the risk that scored the highest of all other individual risks in all risk categories is travel restrictions ($M = 4.86$). Travel advisories and warnings issued by governments about travel to countries in the EAME have shown to have a damaging impact on dive tourism businesses, deterring dive tourists from travelling to those countries. Kenyan dive operators feel this is the most impactful risk on their businesses.

Table 6.1: Colour coding responses of external risks to assist in the interpretation of results

Level of impact Colour Code	Likert scale	Cumulative Likert scale results
No impact	1	1.00–1.80
Low impact	2	1.81–2.60
Moderate impact	3	2.61–3.40
High impact	4	3.41–4.20
Very high impact	5	4.21–5.00

Table 6.2: Highest risk category mean scores by country comparison (colour coded as per Table 6.1)

Risk Category	Country				Overall Mean by risk category (M)	Individual risks with highest mean	* Most common risks
	Kenya	Tanzania	Mozambique	South Africa			
Direct Environmental Risks (DER)	Coral extraction (M = 2.86)	Overfishing (M = 4.30) Destructive fishing (M = 4.30)	Overfishing (M = 3.38)	Marine pollution (M = 2.11)	2.15	Overfishing (M = 4.30) and Destructive fishing (M = 4.30)	Overfishing
Indirect Environmental Risks (IER)	Marine pollution (M = 2.29)	Coral bleaching (M = 3.40)	Marine pollution (M = 2.50) and Extreme weather events (M = 2.50)	Extreme weather events (M = 2.44)	2.02	Coral bleaching (M = 3.40)	Marine pollution (plastic, floating marine debris)
Domestic Risks (DEcR)	Price inflation (M = 3.57)	Price inflation (M = 3.70)	Depressed local economic activity (M = 4.00) and High fuel prices (M = 4.00)	Price inflation (M = 4.56)	3.24	Price inflation (M = 4.56)	Price inflation
International Economic Risks (IEcR)	Economic recessions (M = 3.14) and Financial crises (3.14)	Economic recessions (M = 3.90)	Dive tourist accessibility (4.00)	Dive tourist accessibility (4.33)	3.34	Dive tourist accessibility (4.33)	Economic recessions, and Dive tourist accessibility
Domestic Social Risks (DSR)	Local health and disease epidemics (M = 1.71)	Rising unemployment (M = 3.40), and Increased dependency on marine resources by communities (M = 3.40)	Population growth along the coast (M = 4.13)	Domestic Crime (M = 4.00)	2.79	Population growth along the coast (M = 4.13)	Domestic crime (by highest impact)
International Social Risks (ISR)	International crime (M = 4.29)	Global disease epidemics (M = 3.70)	Global disease epidemics (M = 3.13)	Global disease epidemics (M = 2.78)	2.87	International crime (M = 4.29)	Global disease epidemics
Domestic Political Risks (DPR)	Political instability (M = 4.43)	Political instability (M = 3.80)	Government corruption (M = 4.00)	Restrictive MPA regulations (M = 4.00)	3.24	Political instability (M = 4.43)	Political instability
International Political Risks (IPR)	Travel restrictions (M = 4.86)	Travel restrictions (M = 3.50)	Strict visa regulations (M = 4.38)	Strict visa regulations (M = 3.78)	2.92	Travel restrictions (M = 4.86)	Strict visa regulations, and Travel restrictions

* Most common risks – these are the external risks which appear most often based on the highest impact mean scores per country

The risks with the highest impacts which occur most often are referred to as the most ‘common risks’. These are provided in Table 6.2 to illustrate correlations between individual risks which have the highest impacts (second last column) and the most common risks (last column). Thus, from this analysis, the most common individual risks *with* the highest impacts are **overfishing; price inflation; dive tourist accessibility; political instability; travel restrictions; and strict visa regulations.**

To better demonstrate the level of impact of the external risks, a risk radar was developed. This risk radar considers the individual risk values as determined by their level of impact which is in turn determined by their individual mean score. Each individual risk has therefore been plotted on the risk radar based on its individual mean scores (Section 5.3). It should be noted that the values plotted on this risk radar consider the overall mean results for the entire region. If the results were calculated by country, the dots plotted on the risk radar would look quite different. Figure 6.1 illustrates the *direct* environmental and *domestic* economic, social and political risks for the region. Figure 6.2 illustrates the *indirect* environmental and *international* economic, social and political risks for the region.

The risk radar of domestic risks (as represented in Figure 6.1) illustrates that at a regional level, high fuel prices, price inflation and depressed local economic activity (domestic economic risks); and political instability, restrictive government regulations, and lack of service delivery (domestic political risks) have a high impact on dive operators. The risk radar of international risks (Figure 6.2) illustrates that economic recessions and financial crises (international economic risks); and strict visa regulations and travel restrictions (international political risks) have the highest impacts. What stands out in this analysis is that **domestic economic risks, domestic political risks, international economic risks and international political risks have the highest impact on dive operators in the region.**

The risk radars enable the impacts of risks to be interpreted quickly and easily and have provided an overview of the external risks affecting dive operators in the EAME. The risk radars in Figures 6.1 and 6.2 demonstrate that at a regional level, most risks are centred on the moderate risk level. It is clear that both domestic and international economic and political risks have the highest impacts, social risks have mostly moderate impacts, and direct and indirect environmental risks have the lowest impacts. While international risks are beyond the control of individual countries, the fact that economic risks and political risks have such a

significant impact should send a strong message to governments within the EAME of the importance of economic and political stability for dive tourism to flourish.

By identifying which external risks have the highest impact on scuba diving businesses in the region, and by offering the results in Table 6.2 and the presentation of the risk radars (Figure 6.1 and 6.2), secondary research objective 2 has been thoroughly achieved.

Risk radars, as presented in Figures 6.1 and 6.2, can provide very useful information about the current threats present in a business environment. If such risk radars are applied in practice, they can offer up-to-date information of current external risks. For example, they can be uploaded onto dive industry websites and be available on other online platforms, with real-time updates using data input from the dive operators themselves. Collectively, these can be presented on an online dashboard with other information (such as weather reports, flight schedules, coral health reports, exchange rates) for a quick and easy overview of what is happening at present, allowing dive operators to make informed business decisions. These risk radars could also be used by other industries.

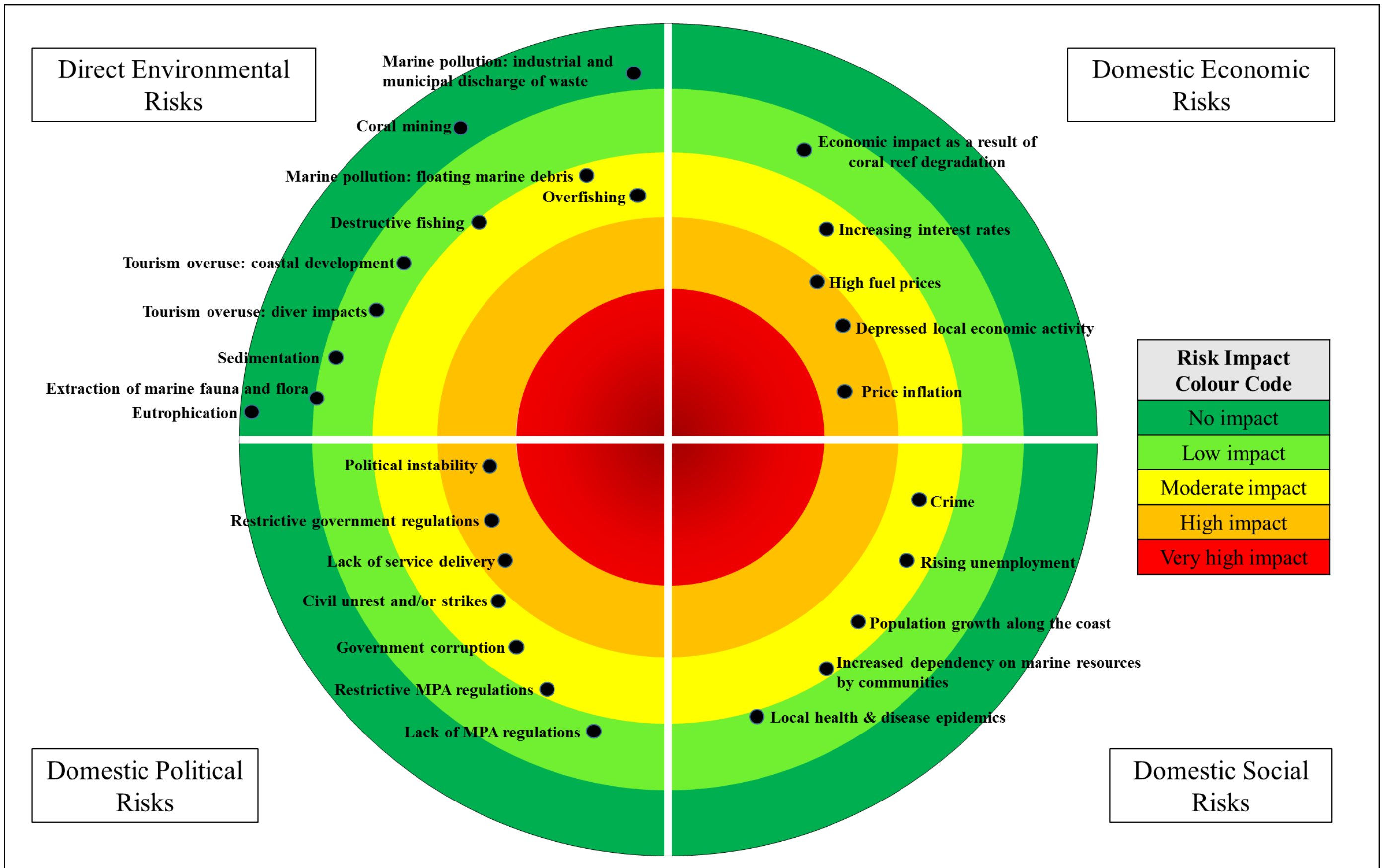


Figure 6.1: Risk radar for *direct* environmental risks and *domestic* economic, social and political risks

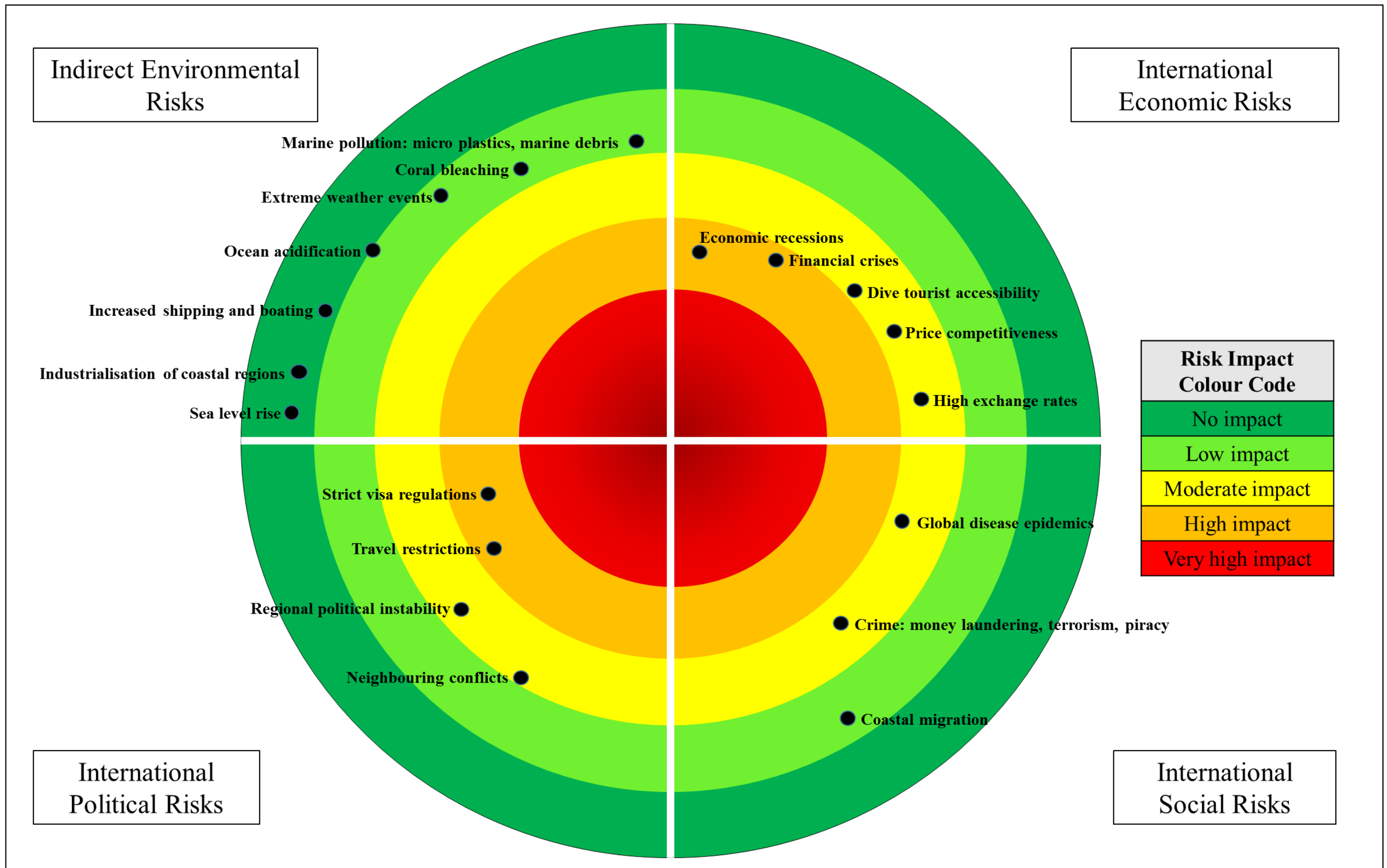


Figure 6.2: Risk radar for *indirect* environmental risks and *international* economic, social and political risks

6.2.3. Secondary research objective 3

- To compare individual external risks experienced by each of the countries in the EAME (Kenya, Tanzania, Mozambique and South Africa) using a cross-case analysis

Section 5.4 in Chapter 5 provided a comprehensive analysis of dive operators' businesses in the EAME and the external risks that each country is exposed to. A cross-case analysis allowed the researcher to conduct a more in-depth investigation and to draw further inferences on the level of impact that external risks may pose to dive operators' businesses in different parts of the EAME region. The risks with the highest impact by country within the EAME are presented in Figure 6.3. For each country, this figure highlights the individual risks per risk category which are at present likely to hold the biggest threats to dive tourism businesses. The risks presented in Figure 6.3 are those with a high to very high level of impact (4 and 5 on the Likert scale). The cross-case analysis provides an overall view of the region and highlights areas where external risks have a significant impact. *By providing a map, dive operators, governments, NGOs, investors and local communities can get a sense of where such risks are impacting and take appropriate measures to limit their exposure to such risks. The ability to distinguish different external risks between various areas/regions/countries can act as a very powerful analysis tool when assessing threats to the dive tourism industry. This information is particularly useful to dive organisations such as PADI, and prospective dive operators looking to open businesses in stable economic environments. Additionally, dive operators can assess emerging threats to the region and take timely and suitable steps to counteract them.*

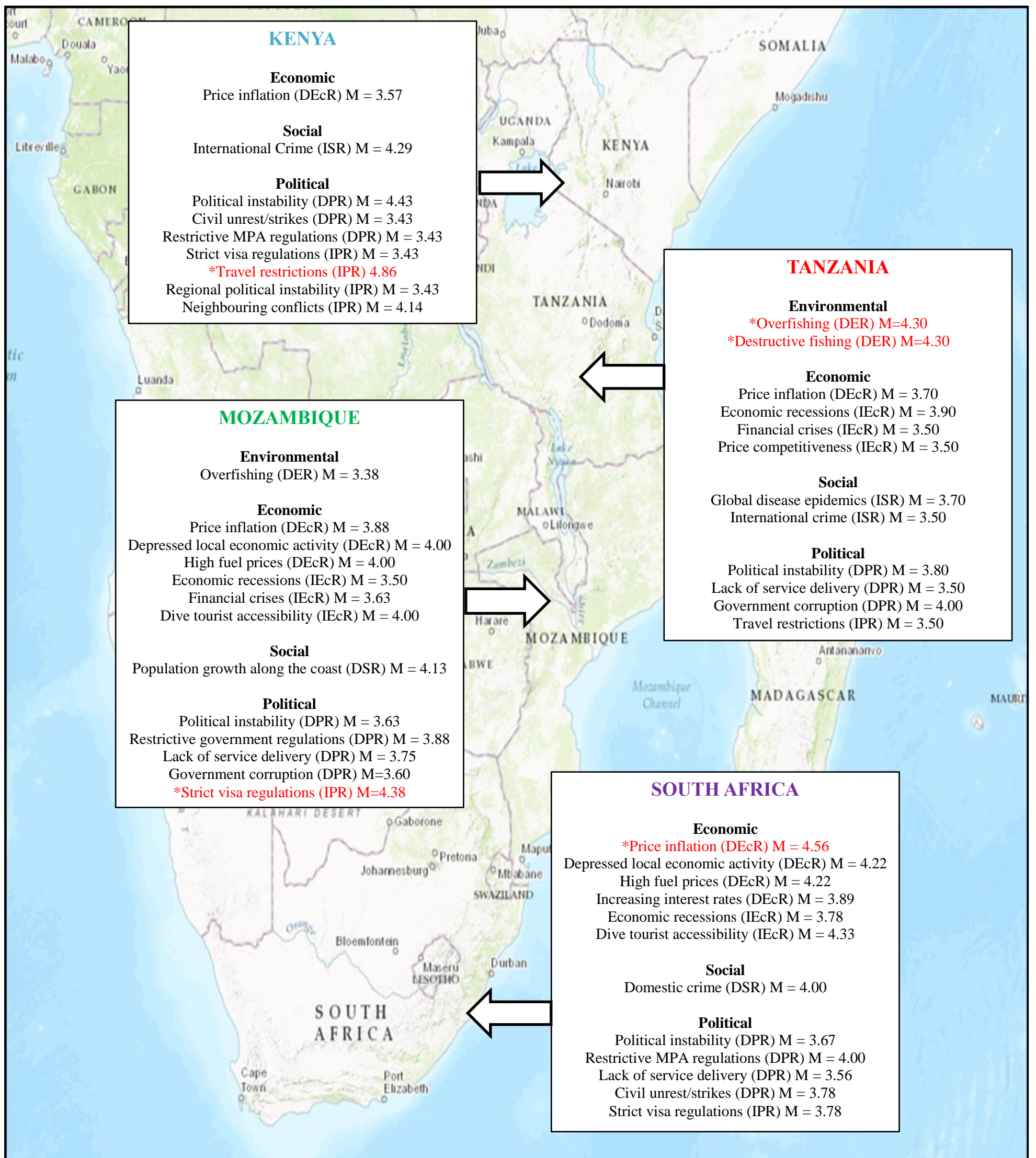


Figure 6.3: Map of the EAME indicating the individual risks per country with high to very high impacts

* For each country, the highest impacting individual risk is shown in red.

The following section provides a comparison of the impact that external risks are perceived to have on the dive tourism industry by country. The discussion sometimes goes beyond Figure 6.3, indicating risks that are not in the 'high' to 'very high' risk category.

Environmental risks

While the overall mean ($M = 2.09$) for environmental risks is currently the lowest of all the risk categories, dive operators in the EAME feel that these risks will have a significant impact on their dive operations in future. This is supported by the findings showing that dive operators consider coral reef degradation as continuing to worsen. Dive operators in Tanzania expressed the highest level of concern with regard to **overfishing, destructive fishing and marine pollution**, with overfishing and destructive fishing being the highest risks scored for the country ($M = 4.30$). Mozambique featured close behind in terms of environmental risks. The trend seems to be that coastal development and population growth are closely correlated to fish population reduction. This is expressed by the exploratory factor analysis which indicates the combination of items in fish population reduction, coastal urbanisation and overuse factors are closely correlated. Kenya has expressed some concern over the **extraction of coral fauna and flora** for the live fish and aquarium trade in Asia. For direct environmental risks ($M = 2.15$) only dive operators in Tanzania and Mozambique reported a high to very high impact. *Governments and MPAs should engage with stakeholders (local communities, dive operators, local business owners, fishing industry representatives) to collaborate in finding solutions to limit the destruction of coral reefs and emphasise the importance of sustainable tourism. Governments should impose stricter policies and legislation on MPA's.*

Indirect environmental risks ($M = 2.02$) are ranked lowest of all external risk categories. Tanzania scored the highest when it came to **marine pollution** (from shipping, floating marine debris, micro-plastics) and **coral bleaching** (from past and current El Niño events). High correlations exist between regional coastal development and increasing economic development in the region, as expressed in the exploratory factor analysis. These correlations were seen as factors which could be influencing the current indirect environmental risks. No indirect environmental risks scored as a high to very high impact by country or region. Evidence of recent climate change-related events (ocean acidification, sea level rise, coral bleaching, sea surface temperature rise and marine pollution) indicates that coral reef and marine ecosystem health is at further risk of degradation and decline. The over 60% mortality

of the coral on the Great Barrier Reef as a result of the last El Niño event indicates the dive tourism industry is at risk. The addition of other stressors such as marine pollution could further disrupt the dive tourism industry.

Economic risks

Economic risks ($M = 3.29$) scored as a moderate risk. Domestic economic risks ($M = 3.24$) have a high prevalence in the region. **Price inflation** has the most significant impact on all countries, whereas **depressed local economic activity** and **high fuel prices** impact most severely in Mozambique and South Africa, indicating a high correlation between these two countries. **Price inflation** ($M = 4.56$) scored as the highest risk for South Africa and the highest of all economic risks. The exploratory factor analysis revealed that items related to economic indicators (inflation, interest rates and fuel prices) have an impact on the economy and therefore the dive tourism industry. This factor is closely correlated with depressed local economic activity, indicating that these economic risks are interrelated and can be said to have a high degree of influence on dive operator businesses.

International economic risks ($M = 3.34$) ranked the highest among all risk categories. South Africa and Mozambique indicated that they were most affected by **dive tourist accessibility**. Access to remote dive destinations is not improving as road conditions remain in a poor state, and flights to these areas are very limited and expensive. Interestingly, dive operators in Kenya felt that international economic risks did not pose as great a threat to their businesses. Those operating in Tanzania felt that **economic recessions** and **price competitiveness** played a greater role in terms of their impact on sustainability. Tanzania and Mozambique also considered the 2008 **financial crisis** as impacting on their businesses, while those in Kenya and South Africa felt this to be less so. It is important to recognise that businesses today operate as part of a globalised economy, and are more dependent on, and also more influenced by, the global marketplace.

Social risks

Social risks ($M = 2.83$) are considered to have a moderate impact in the EAME. Dive operators in South Africa consider **crime** as having the most significant impact on their businesses in terms of domestic social risks ($M = 2.79$), with crime scores indicating that crime is the most significant domestic social risk in the region ($M = 3.03$). Given the high level of social unrest in Kenya, it is interesting to note that crime does not feature as a risk in

this country. The risk of **population growth** impacting on dive operators is felt mainly in Mozambique because rapid coastal development is affecting coastal areas. With regard to international social risks ($M = 2.87$), **international crime** has the highest impact in Kenya as terrorism and piracy severely affect its tourism industry, and the ongoing threats have not abated. Tanzania has also been affected by terrorism but mostly as a result of its proximity to Kenya. **Global disease epidemics** such as the Ebola virus in 2014 and 2015 had a significant impact on dive operators in the region, specifically Tanzania.

Political risks

Although political risks ($M = 3.08$) are considered to have a moderate impact in the region they are on par with economic risks. Some of the highest impacts in the region are a result of political risks. Poor governance is the most important factor, as expressed in the exploratory factor analysis, indicating that government corruption, restrictive government regulations, political instability, civil unrest and/or strikes, and lack of service delivery have a significant impact on the dive tourism industry in the region. **Political instability** ranks as the highest domestic political risk ($M = 3.24$), and is considered a very high risk in Kenya and a high risk for the rest of the region. Kenya has a long history of political turmoil, at election time, closely correlating with regional political uncertainty. **Restrictive government regulations** have a high impact in Mozambique and South Africa, with **lack of government services** predominating in Tanzania, Mozambique and South Africa. **Civil unrest and/or strikes** are prevalent in Kenya and South Africa and **government corruption** is felt most severely in Tanzania and Mozambique.

When it comes to enforcement of **restrictive MPA regulations**, Kenya and South Africa feel that these policies restrict the growth and sustainability of not only the dive operators and the dive tourism industry in their respective locations, but also the tourism supply chain in the areas surrounding the MPAs. Various examples were cited, such as authoritative regime-style authorities imposing heavy fines on dive operators, cancelling permits and restricting access to boat launch sites as a result of disagreements with MPA authorities, and highly restrictive rules which impinge on revenue generation.

The highest individual risks out of all the external risks is **travel restrictions** ($M = 4.86$) imposed by international governments on countries with political or socioeconomic instability. Such is the case in Kenya, whose tourism economy has been devastated by **neighbouring conflicts**, **terrorism** and **regional political instability**. **Strict visa**

regulations imposed by foreign countries is considered to have a high to very high impact in Mozambique, Kenya and South Africa, with this ($M = 4.38$) being the highest external risk for Mozambique. *The proposed single African passport which will allow access to all African countries will hopefully reduce this external risk in future.*

With the comparison of individual external risks drawn together above, and dealt with in detail in Chapter 5, secondary research objective 3 has been achieved.

6.2.4. Secondary research objective 4

- To assess the perception of dive operators regarding whether external risks would influence a dive tourist's decision to travel to the dive operator's area of operation in the EAME

The dive operators' perceived assessment of whether a dive tourist would travel to the region if certain external risks were present suggested overwhelmingly that a dive tourist is less likely to travel to the EAME given the external domestic and international risks present. However, it should be noted that the dive operators' responses used to answer this objective were based on past experiences and events, and they are solely the opinion of the dive operators and not of the dive tourists. In summary, dive operators voiced economic and political risks as the main cause (with a 91% probability) for dive tourists choosing not to travel to countries in the EAME. Social risks were slightly lower at 82%, while environmental risks were estimated at 62%. The results of this objective reaffirm the position that dive operators fear, which is that dive tourists are strongly influenced by the presence of external risks in the region, and are less willing to travel to a dive destination when such risks are present. *The response to attracting dive tourists when such external risks are present could be to offer sales and promotions. Dive operators could also use social media by providing updates on current events, and putting dive tourists at ease regarding travelling to the area. Dive operators could also offer package deals together with safari companies to attract more business to their area of operation.*

6.2.5. In summary: Achievement of research objectives

The secondary research objectives which have been discussed above have demonstrated that external risks can have a significant impact on the sustainability of dive tourism in the EAME. While each country, by comparison, shows a similar trend in impacts by risk categories, each country in the EAME has been shown to have its own distinct set of external

risk impacts. **Kenya** ranks highest in **international social risks (ISR)**; **Tanzania** ranks highest in **international political risks (IPR)** and both **direct and indirect environmental risks (DER and IER)**; **Mozambique** ranks highest in **domestic social risks (DSR)**; while **South Africa** demonstrates the highest impact for **domestic and international economic risks (DEcR and IEcR)** as well as **domestic political risks (DPR)**. It is these differences that require further interpretation and deeper understanding at both local and regional level to gain the insights necessary for the effective management of these risks.

The extent to which external risks in the region are present – with over 85% of respondents feeling that **economic and political risks have the highest impact** on their dive operations presently, that **environmental risks will pose a bigger threat to their businesses in future**, and that over **60% of them have not implemented any adaptation strategies** to mitigate these risks – suggests that there is a need to assist dive operators to reduce their exposure to such risks.

The secondary research objectives were an attempt to address the primary research objective, which was to identify and assess the external risks that may be affecting the sustainability of dive operators in the EAME. These risks have been identified, thereby achieving the primary research objective. The following section details the way in which the achievement of the primary and secondary research objectives has addressed the research problem outlined in Section 1.2.

6.3. ADDRESSING THE RESEARCH PROBLEM

In Section 1.2, several knowledge gaps were outlined which shaped the research. These are briefly returned to below to show how this research addressed the gaps in the research problem.

1. Due to the threat to SDT as a result of environmental, social, political and economic impacts, the need to better understand the impact of these external risks was identified. This study determined that external risks have an impact on dive operators in the EAME. Coral reefs are the heart of the scuba diving industry and dive operators are extremely reliant on their health for a sustainable business. By identifying the external risks (environmental, economic, social and political), and their level of impact on the sustainability of dive operators' businesses, *secondary research objectives 2 and 3* have been addressed. In so doing, this research gap was

also addressed.

2. Most research on the scuba diving industry focuses on the environmental risks with more research needed on the wider ranging impacts of economic, environmental, social and political risks. This study thus adopted a wider range of external risks. This included not only environmental external risks, but also economic, social and political external risks. By grouping these into direct/domestic and indirect/international external risks, conducting a detailed literature review on these, and assessing their level of impact on dive operators' businesses through primary research, this research problem has been addressed, specifically for the scuba diving industry within the EAME (*secondary research objectives 2 and 3*). It must be stated, that while the majority of research has focused on environmental risks which, according to dive operators, are expected to have a high impact on the scuba diving industry in future, the risks that feature as most significant at present had not been addressed. This is a highly interesting finding and makes this research even more relevant.
3. Studies have traditionally focused on the demand side of tourism, but little research has focused on tourism from the dive operator's point of view (supply side). This gap was addressed by focusing on the *dive operators* in the EAME. *Secondary research objective 1* identified certain biographical information which allowed the researcher to draw conclusions about the dive operators' businesses, such as identifying the dive operator's location; determining how many years they have been in operation; determining the percentage of income derived from scuba diving activities; determining the percentage of scuba diving activities occurring on coral reefs; determining the proximity to MPAs/marine reserves; and the origin of scuba diving tourists. In addition, the risks were identified from the perspective of the dive operators.
4. Dive tourists today have a greater choice of travel destinations and have greater flexibility to substitute their travel destination if there is instability or risk of harm in a region. The influence of risks on a dive tourist's decision to travel to a dive destination within the EAME was therefore investigated. As this study focused on the supply side of tourism, the researcher gathered the perceptions of the dive operator on this topic. The results indicated that dive tourists have a low tolerance for uncertainty and risk, given that they have greater flexibility to choose the time and place of their diving holiday/excursion. By addressing *secondary research*

objective 4, this research problem was addressed.

In addition to the specific research gaps addressed above, the research problem highlighted the significant impact that these external risks can have on the scuba diving industry. The identified risks pose a real threat to the natural environment and society, and could cause a decline in dive tourist numbers. The research thus set out to gain a better understanding of these risks and to increase awareness of them.

The research problems described in Section 1.2 led to the formulation of the primary research objective, which was to **identify and assess the external risks impacting on the scuba diving industry in the East African Marine Ecoregion (EAME)**. These were addressed by researching the available literature (secondary research) and by answering the primary and secondary research objectives (primary research) through the collection, analysis and presentation of the primary data. By answering the primary and secondary research objectives, the research problems listed above have been addressed.

In closing, it must, however, be stated that in identifying these external risks they may not be solvable, as by their very nature, external risks are those which an entity (company, organisation, person) has little or no influence or control over (Kaplan and Mikes, 2012). The research revealed that the external risks that have been addressed in this study:

- apply to the real world and have demonstrated their effect on the dive tourism industry;
- are mostly beyond the scope of control of small businesses such as dive operators who have little or no influence on them;
- have not been given much consideration by dive operators in developing adaptation strategies to mitigate such risks;
- indicate that there is not much that can be done to shield dive operators from international risks;
- stress the need for governments (national/local/MPAs) of the EAME countries to bring stability, rule of law, tougher regulations and improved business incentives to the region.

In spite of aspects that are beyond the control of dive operators, there are a few suggestions that can assist dive operators in managing their businesses:

- Risk management strategies should be implemented to mitigate or limit exposure to external risks.
- Marketing activities (sales, promotions) should be increased through the use of social media and the internet.
- Cost overheads should be reduced when external risks are high and may cause business disruption.
- Business communities, which include all stakeholders (local communities, suppliers, tourism agencies/operators, regulatory authorities, and local businesses) of the tourism supply chain, should be formed that will bolster local and regional integration.
- The Professional Association of Diving Instructors (PADI) has recently published ‘PADI’s Four Pillars of Change’ (Bates, 2017). The four pillars are Ocean Health; Marine Animal Protection; People and Community; and Health and Wellness. In alignment with the United Nation’s Sustainable Development Goal 14 (2017), the aim of which is to conserve and sustainably use the oceans, seas and marine resources, scuba divers can apply these four pillars to commit to the conservation of coral reefs (Appendix G).

6.4. CONTRIBUTION OF THE RESEARCH

By achieving the primary and secondary research objectives of this study the following contributions have been made to the dive tourism industry:

1. A conceptual framework for the scuba diving industry (Figure 3.2) was developed which encompasses three models which emanate from crises relevant to the scuba diving industry. The purpose of this framework was to provide context and to guide the reader on how external risks (*direct/domestic and indirect/international*) affect dive operators. The framework encapsulates the environmental, economic, social and political aspects of tourism risks (Henderson, 2007), the tourism risk model Shaw (2010), and the dive tourism industry (Dimmock and Musa, 2015) (Section 3.3). Future research could make use of this new framework.
2. The researcher proposed the term ‘dive tourism hotspots’. This term was developed by the researcher and has not been used before. This can be used in future as an encapsulating term to identify key areas of SDT in the context of marine tourism.
3. Table 6.2 highlights the highest risks per risk category and per country. This is a

contribution for use by the dive operators and the respective governments of these countries, travel agencies, and tourism operators, as it represents at a glance the risks that are most pressing. Using the colour-coded table, dive operators in each country can identify which risks have the most impact on them the most in each risk category. Dive operators can also identify the most severe individual risk that may require their immediate attention. The researcher has not seen this in previous research, which adds to the significance of the study.

4. The risk radars in this chapter (Figures 6.1 and 6.2) also contribute to a current understanding of which risks are most pertinent according to each risk category. In two figures, a bird's eye-view is provided of the *direct/domestic* and *indirect/international* risk categories, respectively. For the EAME region, these risk radars can provide a snapshot of what is currently being experienced in the dive tourism industry in the region. While risk radars have been applied both in principle (Huang, Wu and Renn, 2016) and in practice in various risk management applications, the risk radars presented are not found in any previous studies that relate to the dive tourism industry.
5. An additional contribution of this research was the map (Figure 6.3) identifying and comparing the individual external risks against each of the countries in the EAME. By identifying which external risks have the highest impact at a country level, dive operators, governments, MPAs, travel and tourism organisations, hotel groups and investment firms can be more responsive to assessing and responding to the external risks that are more prevalent in their area of operation.
6. Finally, the researcher feels that the most important contribution, according to the results of this study, is the awareness that has been generated about the impact that external risks (both *direct/domestic* and *indirect/international*) can have on a type of business, and its surrounding society and economy. As identified in the research problem, external risks for tourism have been extensively studied, but the same has not been done for the dive tourism industry. The entire study, but particularly contributions 3, 4 and 5 detailed above, encapsulate the external risks impacting on the dive tourism industry from the perspective of the supply side of tourism (dive operators). Armed with the knowledge that has been presented in this study, dive operators can respond to current and future threats and crises in a more informed and intuitive way.

6.5. LIMITATIONS OF THIS STUDY

One of the limitations of this study was that the sample list was collected mainly from online sources and some dive operators may have been excluded as a result. The other limitation was that only 44% of the population responded, which meant that the data for the entire region was not complete and as a result a full comparison of dive operators was not possible. Including all dive operators would have added more validity to the findings.

While there was sufficient data to encapsulate the cross-case analysis by country, a more comprehensive analysis would have been possible if the survey had been conducted in person for all the dive operators, thus providing an opportunity to probe further, as compared to an online survey which has a defined set of questions. This would have allowed the dive operator to build on the reasons for each individual risk, adding greater depth and understanding to the overall results. This was not a feasible option however, as the cost of travelling to all the dive operators along the entire length of the EAME was too high.

6.6. SUGGESTIONS FOR FURTHER RESEARCH

As this study was mostly exploratory in nature, more information could be drawn for future research, such as exploring and assessing the wider tourism supply chain for the scuba diving industry. There are certain interesting factors such as internal risks, growth strategies, business resilience and specific adaptation strategies that could be considered in future research.

A key suggestion would be to provide a mixed method approach in further research to obtain a deeper and more comprehensive picture of the issues. This would provide the researcher with more context by discussing the issues at hand rather than relying only on quantitative data to draw conclusions.

While this study was confined to dive operators who operate within the EAME, further studies on external risk identification and assessment could be undertaken in future which take into account the Western Indian Ocean (WIO) islands as well as other coral reef regions where scuba diving is a key tourism attraction.

As external risks are difficult to predict, it is hard to forecast their impacts. Historical events can provide some insights into the effects of external risks however, and the results of this

study could provide a reference point for dealing with them in future by providing a baseline of data for future analysis.

The Blue Economy stated the need to identify areas for growth, and the results of this study could be used to assess the impact of external risks on the growth of the Blue Economy.

Finally, formulating a risk management model that highlights adaptation strategies for addressing external risks would add value to the dive tourism industry.

6.7. CONCLUSION

The aim of this study was to identify and assess the external risks impacting on the scuba diving industry in the EAME.

Coral reefs are the primary product offering from which scuba divers derive their sense of enjoyment and are the principal purpose for the existence of a scuba diving industry in southern and eastern Africa. The **environmental** degradation of coral reefs, whether direct or indirect, while not seen as a threat to the scuba diving industry in the region currently, will more than likely be a key threat in the near future. For example, coral bleaching caused by elevated sea temperatures has resulted in the death of 67% of coral on the Great Barrier Reef as a result of the recent 2015/6 El Nino event. While the scale of this global event has yet to be fully quantified, it is expected that any coral reef mortality in the region as a result of coral bleaching may deter dive tourists from travelling to the EAME.

Social change brought about by human movement to coastal regions, increasing populations and their ancillary effects (crime, global disease epidemics) have been shown to have growing consequences for the health of the coastal and marine environments in the EAME. **Economic** risks were shown to have the greatest impact on the region as a whole, impacting the supply side of the marine tourism industry through price inflation, economic recessions and accessibility to dive tourism sites. Similarly, **political** risks are considered a high to very high risk, especially political instability. Travel restrictions imposed on countries severely limit their ability to generate tourism income, and strict visa regulations also have a large impact.

This dissertation also used a measure to determine whether a dive tourist would decide to travel to the east coast of Africa to scuba dive given the external risks present. Overall, there is a sense that dive tourists are sensitive to changes in economic, social and political

circumstances. Accordingly, they are less likely to travel to the region if there is economic uncertainty both within the borders of their country or stemming from abroad; political instability which makes them feel that their safety is at risk; or social issues which may have the potential to disrupt their dive tourism experience.

Overall, external risks seem to have a low environmental impact, and moderate social, economic and political impacts. The risk categories that have the highest impact are **domestic economic risks (DEcR)**, **international economic risks (IEcR)**, **domestic political risks (DPR)**, and **international political risks (IPR)**. Also, given that dive operators perceive political and economic risks to be major components of risks in future, they also expect environmental risks to pose significant challenges to their business operations going forward. Additionally, the fact that only 11% of dive operators have applied sufficient adaptation strategies to ensure the long-term viability of their dive operations shows the importance of encouraging mitigation strategies among dive operators and providing assistance on how they can address external risks in future. At an individual risk level there are key areas where the most common risks closely match the risks with the highest impact, thus highlighting their relevance as risks that need to be urgently addressed. This is not to say that other risks are not as important, as individual dive operators in specific regions along the east coast of Africa may often see less common risks as having a very high impact on their scuba diving businesses. The challenge remains that many of the external risks emerging in this study are beyond the control of dive operators. Some of them can be mitigated with the assistance of the governments of Kenya, Tanzania, Mozambique and South Africa; while others remain international problems, hard to control and manage.

In closing, the primary research objective of this study was to identify and assess the external risks that have an impact on the scuba diving industry in the EAME. In support of the primary research objective, four secondary research objectives were developed. These were: (1) to identify the scuba diving operators in the EAME and their scope of operation, (2) to determine the external risks most relevant to dive operators in the EAME and to assess their level of impact, (3) to compare individual external risks experienced by each of the countries in the EAME (Kenya, Tanzania, Mozambique and South Africa) using a cross-case analysis, and (4) to assess the perception of dive operators regarding whether external risks would influence a dive tourist's decision to travel to the dive operator's area of operation in the EAME. By achieving these secondary research objectives, the primary research objective was

achieved. Therefore, by achieving the primary and secondary research objectives the research problem has been addressed.

By identifying and assessing external risks in the dive tourism industry in the EAME, the research undertaken makes a contribution to the dive tourism industry and the wider field of tourism management. This study adds value by providing key insights on external risks and how they may impact on dive operators in the scuba diving industry of the EAME. Some of the findings would also hold relevance for dive operators in the rest of Africa and around the world. This study also has implications for tourism management in the EAME and further afield. This knowledge can assist businesses, society and economies in responding to current and future threats and crises in a more informative and intuitive way.

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APPENDICES

Appendix A: Structured interview schedule



LETTER OF CONSENT TO PARTICIPATE IN A STUDY

08th August 2015

Dear Dive Operator

I, Dimitri Dimopoulos, am doing research towards my Masters in Commerce at the University of South Africa (Unisa). My supervisors are Prof. Ciné van Zyl (School of Economic Sciences) and Ms. Dorothy Quieros (Department of Tourism Management). The title of my research is: **External risks impacting on the dive tourism industry in the East African Marine Ecoregion (EAME).**

Existing literature has highlighted three main areas where issues exist. Firstly, dive operators rely on high-quality coral reef ecosystems to draw in dive tourists and these are becoming degraded and less abundant as a result of overuse and marine resource exploitation. Secondly, economic and political influencers such as economic recessions, the increasing cost of travel, and political instability, have an impact on the number of dive tourists travelling to or visiting coral reefs each year, and thirdly, societies living on or near coral reef ecosystems which are dependent on tourism revenue, have been impacted by shifting demographics, local community disenfranchisement, disease epidemics, overpopulation of coastal areas, and an increased demand for marine resources. The aim of this research is to therefore identify the external risks that may be impacting on the sustainability of dive tourism businesses along the East Africa Marine Ecoregion (EAME).

By reading the ethics clearance letter you acknowledge your willingness to participate in this study.

If you have any further queries, you are welcome to contact any of the people below:

- Primary researcher: Dimitri Dimopoulos (04729714@mylife.unisa.ac.za; 072 262 2986)
- Supervisor: Ms. Dorothy Quieros (queidr@unisa.ac.za; 082 337 0074)
- Co-supervisor: Prof Ciné van Zyl (vzylc@unisa.ac.za; 012 433 4698)

Thank you very much for your time and willingness to be part of this research.

Sincerely
Dimitri Dimopoulos



University of South Africa
Preller Street, Muckleneuk Ridge, City of Tshwane
PO Box 392 UNISA 0003 South Africa
Telephone: +27 12 429 3111 Facsimile: +27 12 429 4150
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External risks

A. Environmental risks

3. How would you characterise the health of coral reefs in your areas of operation?
4. How dependent is your dive operation on healthy coral reefs?
5. Do you have coral reef degradation in your area of operation?
6. If so, in what year did you first observe coral reef degradation in your area of operation?
7. Do the following **direct** environmental risks pose any risk to your dive business?
 - Overfishing
 - Destructive Fishing (e.g. drag nets, dynamiting)
 - Marine Pollution
 - Diver Impacts
 - Sedimentation from river run-off
 - Eutrophication (from excess algal growth on coral)
 - Tourism Overuse
 - Coral Mining (Extracting fish and coral for commercial gain)
 - Terrestrial Pollution
 - Anchor damage
8. Do the following **indirect** environmental risks pose any risk to your dive business?
 - Floating Marine Debris
 - Sea Surface Temperature (SST) rise
 - Sea Level Rise
 - Ocean Acidification
 - Extreme Weather events (e.g. El Nino, Tropical Cyclones)
 - Coastal Development
9. Over the next 10 years, do you expect coral reef degradation to:
 - Occur more often
 - Decrease in occurrence
 - Occur with the same frequency



10. In your opinion, what can be done to prevent further coral reef degradation?
11. Do you feel these environmental risks would influence a dive tourist's decision to travel to the region?

B. Economic risks

12. How important is the use of coral reefs to the success of your dive operation?
13. Do the following **domestic** economic risks pose any risk to your dive business? (Participants could choose more than one)
 - High Fuel Prices
 - Price Competitiveness
 - Higher Transport Costs
 - Increased Interest Rates
 - Disposable income
14. Do the following **international** economic risks pose any risk to your dive business?
 - Economic recessions
 - Financial crises
 - Exchange Rates
 - High oil prices
15. Do you know of any dive operators in your area of operation who have closed their business as a result of economic risks?
16. How dependent is your dive operation on economic stability both locally and abroad?
17. Do you feel these economic risks would influence a dive tourist's decision to travel to the region?

C. Social risks

1. How important are healthy coral reefs and their surrounding marine ecosystem to the coastal community living near the coast?



2. Do the following **domestic** social risks pose any risk to your dive business? Please elaborate on each one.
 - Health and disease (malaria, cholera, HIV/AIDS, food and water-borne diseases, etc.)
 - Crime (theft, violence, rape, fraud, corruption, etc.)
 - Coastal Development
 - Environmental degradation of coral reefs (due to increasing population, rising unemployment, etc.)
3. Do the following **international** social risks pose any risk to your dive business? Please elaborate on each one.
 - Global disease epidemics (Ebola virus, Zika virus, etc.)
 - International crime (money laundering, piracy)
 - Coastal migration (people moving to the coast)
4. Do you expect these social risks to continue to affect your dive tourism business in future?
5. Do you feel these social risks would influence a dive tourist's decision to travel to the region?

D. Political risks

1. Do the following **domestic** political risks pose any risk to your dive business?
 - Political corruption
 - Lack of government action
 - Lack of conservation enforcement
 - Lack of infrastructure development
2. Do the following **international** political risks pose any risks to your dive business?
 - Regional political instability
 - Visa regulations
 - Neighbouring conflicts
3. Do you expect these political risks to continue to affect your dive tourism business in future?
4. Do you feel these political risks would influence a dive tourist's decision to travel to the region?

Adaptation strategies

What adaptation strategies have you implemented to deal with these external risks? }



Dive operator demographics

1. In which area of EAME is your dive operation located?
2. How many years has your dive operation been in operation?
3. How many people are employed by your dive operation?
4. Do you require a concession that allows your dive business to operate inside an MPA?
5. With which dive organisation are you mostly affiliated with? (PADI, NAUI, etc.)
6. Do you operate inside or nearby a Marine Protected Area or Marine Reserve? Name it.
7. What percentage of scuba diving activities occur on or around coral reefs in your area of operation?
8. How much of your revenue is generated as a direct result of scuba diving activities on coral reefs?

Scuba diver demographics

1. Which regions of the world are divers most likely to visit from (expressed as a percentage distribution)?
 - Local
 - European Union
 - United States & Canada
 - South America
 - Africa
 - Asia
 - Oceania
2. What is the major draw card for scuba divers visiting this region?
 - pristine coral reefs
 - underwater photography
 - sharks and predatory fish
 - whales and dolphins
 - wreck diving
 - scuba diving courses



Appendix B: Structured survey (online web survey)



Risks impacting on the sustainability of dive tourism in the East African Marine Ecoregion (EAME)

1. Introduction

Thank you for participating in this web survey. Your feedback is important.

You have been chosen to participate in this web survey because you are a dive operator in the East African Marine Ecoregion (EAME) and fall within the scope of my Masters dissertation with the University of South Africa (UNISA).

The purpose of this survey is to identify the external risks that may be impacting on the sustainability of dive tourism businesses along the East Africa Marine Ecoregion (EAME).

The survey will take **10 - 15 minutes** of your time to complete.

Participation is **voluntary and confidential**. Your name will not be recorded in any reports or publications obtained from the results. If you would like to know the results of the web survey, these can be provided to you. There is no penalty or loss of benefit for non-participation. There is no reward or reimbursement for participation. You are free to withdraw at any time without giving a reason. Data from this study will be stored electronically.

This study has received written approval from the Research Ethics Committee of the College of Economic and Management Sciences, UNISA. If you have any questions, please contact Mr D Dimopoulos, (4729714@mylife.unisa.ac.za, +27 (0)72 415 6408), or my supervisor Ms D Queiros, (queirdr@unisa.ac.za).

Thank you for taking the time to read this information and for participating in this survey.

CONSENT TO PARTICIPATE IN THIS WEB SURVEY

- I have read and understood the purpose of the study as explained above.
- I understand that my participation is voluntary and that I am free to withdraw at any time without penalty.
- I am aware that the findings of the study will be anonymously processed into a research report, journal publications and/or conference proceedings.

*** 1. By clicking YES, you give consent to participating in the survey**

Yes

No





Risks impacting on the sustainability of dive tourism in the East African Marine Ecoregion (EAME)

2. Dive Operator Information

*** 2. In which country of the East African Marine Ecoregion (EAME) is your dive operation situated?**

- Kenya
- Tanzania
- Mozambique
- South Africa



Risks impacting on the sustainability of dive tourism in the East African Marine Ecoregion (EAME)

3. Scuba diving tourism hotspot - Kenya

* 3. Which region of Kenya do you operate in?

- Lamu
- Malindi
- Mombasa
- Ukunda
- Wasini
- Watamu



Risks impacting on the sustainability of dive tourism in the East African Marine Ecoregion (EAME)

4. SCUBA diving tourism hotspot - Tanzania

*** 4. Which region of Tanzania do you operate in?**

- Dar es Salaam and surrounding areas
- Mafia Island
- Mtwara & surrounding areas
- Pemba Island
- Tanga and surrounding areas
- Zanzibar Island



Risks impacting on the sustainability of dive tourism in the East African Marine Ecoregion (EAME)

5. SCUBA diving tourism hotspot - Mozambique

*** 5. Which region of Mozambique do you operate in?**

- Bazaruto Islands, Benguerra & Vilanculos
- Ilha da Inhaca & surrounding areas
- Inhambane & surrounding areas
- Memba, Nacala & surrounding areas
- Pomene
- Ponta d'Ouro & Ponta Malongane
- Quirimbas Archipelago & Pemba



Risks impacting on the sustainability of dive tourism in the East African Marine Ecoregion (EAME)

6. SCUBA diving tourism hotspot - South Africa

*** 6. Which region of the iSimangaliso Wetland Park in South Africa do you operate in?**

- North reef complex
- Central reef complex (Sodwana Bay)



Risks impacting on the sustainability of dive tourism in the East African Marine Ecoregion (EAME)

7. Dive operator information continued...

* 7. How many years has your dive operation been in business? Select from dropdown:

8. What percentage of your income is generated by SCUBA diving?

* 9. What percentage of your dive operation's SCUBA diving activities occur on coral reefs?

* 10. Do you operate within or nearby a Marine Protected Area (MPA) or Marine Reserve?

- Yes
 No
 Don't know

*** 11. Origin of SCUBA divers that dive with your business**

(MUST EQUAL 100%)

Local (domestic tourists)	<input type="text"/>
Africa	<input type="text"/>
Asia	<input type="text"/>
Australia & New Zealand (Oceania)	<input type="text"/>
Europe	<input type="text"/>
Middle East	<input type="text"/>
North America	<input type="text"/>
South America	<input type="text"/>



Risks impacting on the sustainability of dive tourism in the East African Marine Ecoregion (EAME)

8. Environmental Risks

*** 12. What level of impact on coral reefs do the following DIRECT ENVIRONMENTAL RISKS have on your dive operation?**

	No Impact	Low Impact	Moderate Impact	High Impact	Very High Impact
Tourism overuse: Diver impacts (breaking coral; high dive numbers on dive sites)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tourism overuse: Coastal development (impacting coral reef ecosystems)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overfishing (on or nearby coral reefs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Destructive fishing (on or nearby coral reefs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sedimentation (excessive sand deposits on reefs from river run-off, storms and wave action, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eutrophication (excess algal growth on coral reefs)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coral mining (extracting coral for commercial gain)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marine pollution: Industrial & Municipal discharge of waste	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marine pollution: Floating marine debris (Plastics, fishing gear debris, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extraction of coral fauna and flora (for aquarium trade, coral for limestone, curios, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 13. What level of impact on coral reefs do the following **INDIRECT ENVIRONMENTAL RISKS** have on your dive operation?

	No impact	Low impact	Moderate impact	High impact	Very high impact
Coral Bleaching (as a result of sea surface temperature rise, El Nino)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sea level rise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ocean Acidification (altering coral and shellfish structure)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extreme weather events (Tropical Cyclones, Floods, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Industrialisation of coastal regions (Ports, Harbours, Effluent, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased Shipping and Boating (damaging reefs, bilge water pollution, alien species, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marine Pollution (plastic, marine debris, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 14. In future, do you expect coral reef degradation to:

- Decrease in occurrence
- Occur with the same frequency
- Occur more often
- Not sure

*** 15. If coral reef degradation continues in your area, how long do you expect your dive business to continue operating?**

- Unsustainable: Close business immediately
- Close business within a year
- Close business within 5 years
- Can continue to operate indefinitely
- Can survive if there is no more coral reef degradation
- Not sure

*** 16. In your opinion, would these ENVIRONMENTAL RISKS influence the decision for dive tourists to travel to your country/region?**

- Yes
- No
- Don't know



Risks impacting on the sustainability of dive tourism in the East African Marine Ecoregion (EAME)

9. Economic Risks

* 17. What level of impact do the following DOMESTIC ECONOMIC RISKS have on your dive operation?

	No impact	Low impact	Moderate impact	High impact	Very high impact
High fuel prices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increasing interest rates (higher cost of borrowing)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Price Inflation (more expensive to run business, price increases, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Depressed local economic activity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Economic impact as a result of coral reef degradation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 18. What level of impact do the following INTERNATIONAL ECONOMIC RISKS have on your dive operation?

	No impact	Low impact	Moderate impact	High impact	Very high impact
Economic recessions (slowdown in global economic activity)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Financial crises (2008 financial crisis, stock market collapse, Brexit, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Price competitiveness (tourist affordability of SCUBA diving products and services, increased operating costs, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
High exchange rates (stronger Euro, Dollar, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dive tourist accessibility (limited access to dive locations, increasing travel and accommodation costs, poor road conditions, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 19. In your opinion, would these ECONOMIC RISKS influence the decision for dive tourists to travel to your country/region?

- Yes
- No
- Don't know



Risks impacting on the sustainability of dive tourism in the East African Marine Ecoregion (EAME)

10. Social Risks

*** 20. What level of impact do the following DOMESTIC SOCIAL RISKS have on your dive operation?**

	No impact	Low impact	Moderate impact	High impact	Very high impact
Local health & disease epidemics (Malaria, HIV/AIDS, food and water diseases, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crime (theft, violence, xenophobia, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased dependency on marine resources by communities (degradation of coral biodiversity)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Population growth along the coast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rising unemployment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** 21. What level of impact do the following INTERNATIONAL SOCIAL RISKS have on your dive operation?**

	No impact	Low impact	Moderate impact	High impact	Very high impact
Global disease epidemics (Ebola, Cholera, Zika virus, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crime: Terrorism, Piracy, drug and human trafficking, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coastal migration (cross-border human movement)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** 22. In your opinion, would these SOCIAL RISKS influence the decision for DIVE TOURISTS to travel to your country/region?**

- Yes
- No
- Don't know



Risks impacting on the sustainability of dive tourism in the East African Marine Ecoregion (EAME)

11. Political Risks

*** 23. What level of impact do the following DOMESTIC POLITICAL RISKS have on your dive operation?**

	No impact	Low impact	Moderate impact	High impact	Very high impact
Political instability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Restrictive government regulations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Restrictive Marine Protected Area (MPA) regulations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of Marine Protected Area (MPA) regulations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government corruption	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of service delivery	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Civil unrest and/or strikes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** 24. What level of impact do the following INTERNATIONAL POLITICAL RISKS have on your dive operation?**

	No impact	Low impact	Moderate impact	High impact	Very high impact
Neighbouring conflicts (wars, ISIS threat, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Regional political instability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Strict Visa regulations (more difficult for dive tourists to enter country, unabridged birth certificates, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Travel restrictions (for example, US or EU issuing travel advisories as a result of terrorism threat, civil unrest, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** 25. In your opinion, would these POLITICAL RISKS influence the decision for DIVE TOURISTS to travel to your country/region?**

- Yes
- No
- Don't know



Risks impacting on the sustainability of dive tourism in the East African Marine Ecoregion (EAME)

12. In Summary

*** 26. Which RISK CATEGORY do you feel has the biggest impact on your dive operation PRESENTLY?**

- Environmental risks
- Economic risks
- Social risks
- Political risks

*** 27. Which RISK CATEGORY do you feel will have the biggest impact on your dive operation IN FUTURE?**

- Environmental risks
- Economic risks
- Social risks
- Political risks

*** 28. In conclusion, given the above risks, have you considered any ADAPTATION STRATEGIES to ensure the long-term viability of your dive operation?**

- Have not looked into it
- Have found no solutions to these risks
- Have considered adaptation strategies but not implemented any
- Have implemented some strategies to mitigate some risks
- Have applied sufficient strategies to ensure long-term viability of my dive operation

Thank you for taking the time to complete the survey.



Appendix C: Ethical clearance certificate



4 August 2015

Ref #: 2015_CEMS_SES_003

**SCHOOL OF ECONOMIC SCIENCES
RESEARCH ETHICS REVIEW COMMITTEE**

This is to certify that the application for ethics clearance submitted by
Mr Dimitri Dimopoulos (student #4729714, 4729714@mylife.unisa.ac.za)

**Risks affecting the sustainability of dive tourism in the East African Marine Ecoregion (EAME)
received Ethics Approval**

The application for ethics clearance for the above mentioned research was reviewed by the School of Economic Sciences on the 4th of August 2015 in compliance with the Unisa Policy on Research Ethics. Ethical Clearance for the project is granted, although the research instrument must receive final approval from both supervisors, before data collection can commence.

You may proceed with the research project on condition that all participants are provided with Informed Consent forms prior to any fieldwork. Participation is strictly voluntary. The research ethics principles outlined by the Unisa Policy on Research Ethics must be adhered to throughout the project. Please be advised that the committee needs to be informed should any part of the research methodology as outlined in the Ethics application (Ref #2015_CEMS_SES_003) change in any way or in case of adverse events. This certificate is valid for the duration of the project. The SES Research Ethics Review Committee wishes you all the best with this research undertaking.

Kind regards,

**Ms C Loedolff
Chairperson**

Executive Dean: CEMS



Open Rubric

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Appendix D: Rationale for questions asked within structured survey

Question in structured survey (Phase 2) (Appendix B)	Rationale for developing the question
Section 2 to 7: Dive operator demographics	
<p>Question 2 to 6 In which country of East African Marine Ecoregion (EAME) is your dive operation situated?</p>	<p>The identification of the location of dive operators in the EAME region satisfies the first secondary research objective. Dive operators are located in clusters along the eastern and southern coast of Africa, which have been defined as dive tourism hotspots (Section 2.3.2). The importance of identifying the location of dive operators provides the researcher with data by which to make comparisons of external risks between dive operators by region. This in part satisfies secondary research objective 3.</p>
<p>Question 7 How many years has your dive operation been in operation?</p>	<p>This question was used to determine the maturity of dive operators in the dive tourism industry in the EAME. Dive operators who have been in business the longest were considered for the structured interviews (Phase 1) as they were expected to provide the most valuable insights based on experience and length of time in operation in their area.</p>
<p>Question 8 What percentage of your income is generated from scuba diving?</p>	<p>This question was derived to confirm the reliance on coral reefs for dive operator revenue generation. The researcher used this question to validate the importance of coral reefs to the sustainability of dive operators and to the scuba diving industry.</p>
<p>Question 9 What percentage of your dive operation's scuba diving activities occur on coral reefs?</p>	<p>This question is useful in determining the dive operator's reliance on coral reefs as a primary product offering. Literature indicates that coral reefs form the primary basis for the existence of scuba diving (Dimmock and Musa, 2015).</p>
<p>Question 10 Do you operate within or nearby a Marine Protected Area (MPA) or Marine Reserve? Name it.</p>	<p>Much of the EAME coastline where scuba diving activities are conducted fall inside MPA's. This question served as confirmation that most dive operators operate within or nearby MPA's, as described in Section 3.4.4.3. Studies have indicated the effective role that MPA's play on the dive tourism industry (Thurstan et al., 2012).</p>
<p>Question 11 Origin of scuba divers that dive with your business?</p> <ul style="list-style-type: none"> • Local (domestic tourists) • Africa • Asia • Australia & New Zealand (Oceania) • Europe • Middle East • North America • South America 	<p>The purpose of this was to determine where most dive tourists originate from. Literature indicates that there are various factors that determine whether dive tourists will travel. While most divers in South Africa are domestic tourists, this is not the case for Kenya and Tanzania which host dive tourists from elsewhere in the world. Mozambique receives most of its dive tourists from South Africa. Accessibility to dive sites (Griffin and Edwards, 2012) and economic recessions (Eugenio-Martin and Campos-Soria, 2013) were highlighted in literature as factors impacting on whether dive tourists travel to destinations (UNWTO, 2015b; WTTC, 2015a). The discussions with dive operators in the structured interviews signified that they were reliant on dive tourists from various regions of the world.</p>

Section 8: Environmental risks – Burke et al., 2011; Henderson, 2007; Richmond, 2011; Shaw, 2010

Question 12

What level of impact on coral reefs do the following direct environmental risks have on your dive operation?

- Tourism overuse: diver impacts (breaking coral; high dive numbers on dive sites)
- Tourism overuse: coastal development impacting on coral reef ecosystems
- Overfishing (on or nearby coral reefs)
- Destructive fishing (on or nearby coral reefs)
- Sedimentation (excessive sand deposits on reefs from river run-off, storms and wave action, etc.)
- Eutrophication (excess algal growth on coral reefs)
- Coral mining (extracting coral for commercial gain)

According to literature, there is direct coral reef degradation along the eastern and southern coastlines of Africa (Burke et al., 2011; Richmond, 2011). By determining the level of impact the researcher could assess the extent to which these risks would impact dive operators. Based on literature, it was deemed important to assess if these risks emerged in this research:

Highly dived coral reefs in places like Zanzibar Island and southern Mozambique have been negatively affected by unregulated and careless tourist activities (boat anchoring, excessive scuba diving and snorkelling) (Richmond, 2011). It was therefore necessary to address this risk and determine its level of impact.

Increased development pressures from coastal population pressures are degrading coral reef ecosystems (Moore and Best, 2001). It was therefore important to ascertain the level of impact that coastal development has on corals which dive operators are so dependent upon for the sustainability of their businesses.

Coral reefs have been overfished thereby reducing the appeal for scuba divers to visit these areas (Burke, et al., 2011; Richmond, 2011), and is an important risk to address for this study.

Destructive fishing has led to the degradation of coral reef habitats along the East African coastline (Obura, 2005; Richmond, 2011) and is an important risk to address for this study.

Constructing and dredging for coastal marinas, hotels, railways, roads and ports causes sedimentation that may change the habitat and negatively impact the ecology of the area (Richmond, 2011). Excessive sediments on reefs have shown to reduce coral health and attraction for divers and are considered important to address.

Changes to nutrients entering oceans from land-based sources can create algal blooms that may smother the coral reefs (Heibel and Ellison, 2010). Reduced algae-eating fish as a result of overfishing, and excess industrial and municipal discharge into the oceans can reduce visibility and water clarity and ultimately also reduce coral reef health leading to reduced diver numbers as a result of unattractive reefs. This is an important risk that needed to be addressed in this study.

Coral rock extracted from reefs in Tanzania is used as a source of calcium carbonate which are baked in kilns to produce lime for construction and sold as curios (Richmond, 2011). Destroying reef habitats for profit is a problem in the region and it was important to address this from the dive operators' perspective.

<ul style="list-style-type: none"> • Marine pollution: industrial and municipal discharge of waste • Marine pollution: floating marine debris (plastics, fishing gear debris, etc.) • Extraction of coral fauna and flora: (for aquarium trade, coral for limestone, curios, etc.) 	<p>An estimated 90% of all wastewater in developing countries is discharged untreated directly into rivers, lakes or the oceans (Corcoran et al., 2010).</p> <p>Waste created by people living on or near the coast has had a serious impact on coastal resources and affected the destination image for tourists (Paterson et al., 2012). Marine pollution is an important risk that is at the forefront of discussion and considered an important risk to assess in the scope of this study.</p> <p>The international trade in corals and coral reef species is contributing to the stresses on marine ecosystems. The extraction and international trade in coral, reef fish, live rocks, and other reef organisms also contributes significantly to the decline and degradation of marine ecosystems (Richmond, 2011). Degraded coral reef may reduce diver numbers therefore affecting the ability of dive operators to attract dive tourists, thereby affecting their profits and sustainability. It was therefore considered important to assess the level of impact this would have.</p>
<p>Question 13 What level of impact on coral reefs do the following indirect environmental risks have on your dive operation?</p> <ul style="list-style-type: none"> • Coral bleaching (as a result of sea surface temperature rise, El Niño, etc.) • Sea level rise • Ocean acidification (altering coral and shellfish 	<p>According to literature, there are indirect environmental risks that are impacting on coral reefs. This includes the eastern and southern coastlines of Africa (Burke et al., 2011; Richmond, 2011; Roe et al. 2016). It was important to assess the impact of these risks on the sustainability of dive operators' businesses in the EAME. By determining the level of impact, the researcher could assess the extent to which these risks would impact dive operators. Based on literature, it was deemed important to assess if these risks emerged in this research:</p> <p>The 2015/2016 El Niño event has seen the highest ocean temperatures on record, elevating sea surface temperatures enough to cause widespread coral bleaching (NOAA, 2016). Scientists attribute this global warming to anthropogenic-related causes. The degree by which coral bleaching has affected the health of coral reefs recently could have a very negative effect on the dive industry and on dive operator's businesses. It was therefore important to ascertain the level of impact that coral bleaching has on corals which dive operators are so dependent upon for the sustainability of their businesses.</p> <p>Sea level rise has been in literature for a while and studies have indicated that Africa is experiencing the effects (Kebede et al., 2012). It was important to address whether dive operators felt if sea level rise would impact on coral reefs and therefore their businesses. Coral reefs need light to grow, which is most abundant in shallow water. Coral reefs also need a stable temperature range to survive. Higher sea levels would lower ocean temperatures, hence the importance of dive operator's perceptions on whether they felt that rising sea levels would impact on their businesses.</p> <p>Increasing levels of acidification in the oceans is impacting on the health of coral reefs and their</p>

<p>structure)</p> <ul style="list-style-type: none"> • Extreme weather events (tropical cyclones, floods, etc.) • Industrialisation of coastal regions (ports, harbours, effluent, etc.) • Increased shipping and boating (damaging reefs, bilge water pollution, alien species, etc.) • Marine pollution (plastics, marine debris, etc.) 	<p>associated ecosystems (Wilkinson and Souter, 2008). This risk has been addressed by scientific researchers in the region, but it was important to address this risk from the point of view of the dive operator.</p> <p>The effects of ocean warming are fuelling further extreme weather events which have the impact of destroying coral (Fischer and Knutti, 2015). Thus, this is an important risk that needed to be assessed.</p> <p>The EAME is poised for dramatic coastal growth of its harbours and ports over the next few decades. This has caused concern as their proximity to coral reefs is having an impact (Richmond, 2011; Burke et al., 2011; Perreira et al., 2014). Such impacts could negatively affect the dive industry and it was therefore important to address the level of impact this may have on dive operator's businesses.</p> <p>Coupled with this is the increased shipping traffic and boating which has the potential to damage coral from groundings and anchor damage (Golgowski, 2015; Howard, 2016; Rappler.com, 2016; Scarlet and Bandeira, 2014). Increased boat traffic can affect the pristine health of coral reefs and may deter tourists away from the region if not carefully monitored. It was therefore necessary to address this risk and determine its level of impact.</p> <p>Marine pollution is increasing. Micro-plastics are a major concern, as is marine floating debris. 80% of marine pollution is land-based (Baztan et al., 2014; Pereira et al., 2014). This risk has been at the forefront of discussion and considered a serious threat to coral reef health, hence its inclusion in this study.</p>
<p>Question 14 In future, do you expect coral reef degradation to:</p> <ul style="list-style-type: none"> • Decrease in occurrence • Occur with the same frequency • Occur more often • Not sure 	<p>The extent to which coral reef degradation is expected to continue, indicates future threats to the dive operator's business. Based on available literature, a number of environmental factors have been responsible for coral reef degradation over the years (Burke et al., 2011). Future environmental threats from the external risks noted above are an indicator of whether these risks would continue to exist. It was therefore important to determine if coral reef degradation would continue in future.</p>
<p>Question 15 If coral reef degradation continues in your area, how long do you expect your dive business to continue operating?</p> <ul style="list-style-type: none"> • Unsustainable: Close business immediately • Close business within a year • Close business within 5 years • Can continue to operate indefinitely 	<p>Coral reef degradation has been observed in the past. It was important to determine to what degree such environmental impacts could have on the sustainability of the dive operator's business in the dive industry.</p>

<ul style="list-style-type: none"> • Can survive if there is no more coral reef degradation • Not sure 	
<p>Question 16 In your opinion, would these environmental risks influence the decision for dive tourists to travel to your country/region?</p>	<p>According to literature, environmental degradation, tourism overuse and poor land-use practices can affect the destination image and be a risk to future tourism opportunities (Crang, 2014; Lew, 2013; Lucrezi et al., 2013; Lowe et al., 2012; Paterson et al., 2012; Watkinson and Cote, 2009). It was therefore important to see if these emerged from this research.</p>
<p>Section 9: Economic risks - Henderson, 2007; Lejarraja and Walkenhorst, 2007; Shaw, 2010</p>	
<p>Question 17 What level of impact do the following domestic economic risks have on your dive operation?</p> <ul style="list-style-type: none"> • High fuel prices • Increasing interest rates (higher cost of borrowing) • Price inflation (more expensive to run business, price increases, etc.) • Depressed local economic activity • Economic impact as a result of coral reef degradation 	<p>Literature indicates that domestic economic external risks affect businesses. By determining the level of impact, the researcher could assess the extent to which these risks would impact dive operators. Based on literature, it was deemed important to assess if these risks emerged in the research:</p> <p>Price volatility in fuel prices has led to negative tourism demand and placing inflationary pressures on the tourism industry (Yong, 2014), and was deemed important to address the level of impact.</p> <p>Interest rate increases can delay tourist consumption affecting dive operators' businesses (Durberry and Sinclair, 2003), and deemed important to address in this study.</p> <p>Price inflation affects a tourist's disposable income (Yong, 2014). The increasing costs of goods and services in the operation of a dive business can have serious implications to profitability and sustainability of the industry. It was therefore important to address this risk and understand its level of impact.</p> <p>Depressed economic activity as a result of extraneous factors such as the 2008 financial crisis have affected local economies in the EAME. Such factors can have a significant impact on dive operators and this risk thus needed to be addressed.</p> <p>Hawkins et al. (2005) state that unregulated tourism development may have an adverse impact on the natural environment. Therefore, the economic impact of coral reef degradation was considered as very important in addressing the problem.</p>
<p>Question 18 What level of impact do the following international economic risks have on your dive operation?</p>	<p>Literature indicates that international economic external risks affect businesses. By determining the level of impact, the researcher could assess the extent to which these risks would impact dive operators. Based on literature, it was deemed important to assess if these risks emerged in this research:</p>

<ul style="list-style-type: none"> • Economic recessions (slowdown in global economic activity) • Financial crises (2008 financial crises, stock market collapse, Brexit, etc.) • Price competitiveness (tourist affordability of scuba diving products and services, increased operating costs, etc.) • High exchange rates (stronger Euro, Dollar, etc.) • Dive tourist accessibility (limited access to dive locations, increasing travel and accommodation costs, poor road conditions, etc.) 	<p>Global slump in growth has impacted on businesses, with falls in employment and industrial output (Eugenio-Martin and Campos-Soria, 2013). Economic slowdowns can affect small businesses, especially in developing countries. It was therefore important to assess the level of impact that economic recessions could have on dive operators and how this would impact the dive industry in the region.</p> <p>Financial crisis triggered an economic slowdown around the world (Candela and Figini, 2012; Pento, 2016; UNWTO, 2011). This has shown to impact on the tourism industry, and therefore an important risk to assess for this study.</p> <p>Tourists compare the price at the tourist destination in relation to the price of choosing an alternative destination (Forsyth and Dwyer, 2009; George, 2008). With access to more dive destinations, dive tourists may find it cheaper to travel to other countries or even locally. This change in tourist behaviour can impact on the dive operator and was therefore deemed important.</p> <p>Changes in exchange rates can impact on a tourist's consumer decisions when it comes to choosing a travel destination (Mapenzauswa, 2015; Oxley and Buecking, 2015; Sandle, 2016). The strength of a dive tourist's currency can have a significant impact on travel decisions which could ultimately affect a dive operator's business. Similarly, a dive operator can experience price shocks on boat parts and dive gear, given that most of these are sourced abroad. These two factors are therefore considered important indicators and need to be addressed.</p> <p>Access to a destination is considered a vital factor for tourism development in Africa (Gauci et al., 2002), hence the importance of how divers reach their destination is an important risk to assess.</p>
<p>Question 19 In your opinion, would these economic risks influence the decision for dive tourists to travel to your country/region?</p>	<p>(1) A study by Eugenio-Martin and Campos-Soria (2013) indicates that consumer behaviour changes are more than likely to affect travel and tourism expenditure during times of economic instability. (2) Findings emerged from the structured interviews was that other dive operators in the area had closed their operations due to economic crises, leading the researcher to want to know to what extent dive operators are dependent on economic stability both locally and abroad. From the responses during the structured interviews, all dive operators agreed that the two points above were a critical component to the sustainability of dive tourism businesses. This served as an affirmation of the question that economic stability is a vital component of tourism growth and needed to be addressed.</p>
<p>Section 10: Social risks - Henderson, 2007; Honey and Krantz, 2007; Richmond, 2011</p>	
<p>Question 20 What level of impact do the following domestic social risks</p>	<p>Literature indicates that domestic social external risks affect businesses. It was therefore important to see if this emerged from this research. By determining the level of impact, the researcher could</p>

<p>have on your dive operation?</p> <ul style="list-style-type: none"> • Local health and disease epidemics (malaria, HIV/AIDS, food and water-borne diseases, etc.) • Crime (theft, violence, xenophobia, etc.) • Increased dependency on marine resources by communities (degradation of coral biodiversity) • Population growth along the coast • Rising unemployment 	<p>assess the extent to which these risks would impact dive operators.</p> <p>Malaria, cholera, HIV/AIDS and food and water-borne diseases have been a common threat to the well-being and livelihoods of people living in Africa, signifying a threat to the tourism industry (Kelland, 2014; Paris, 2014; Rebaudet et al., 2013; Watson et al., 2016; WEF, 2015; UNAIDS, 2015), and therefore considered important to address the level of impact of this on dive operators.</p> <p>Crime in Africa has been at the forefront of the risk discussion and plays a key role in tourism growth in the region (Burke et al., 2011; Hinrichsen, 2011; Richmond, 2011; UNEP/WCMC, 2003). Crime has shown to have significant impact on tourism. It was therefore an important risk to assess in the dive industry in the EAME.</p> <p>The health of coral reefs and their associated marine ecosystems are under threat as a result of degradation, overuse and exploitation given that coastal communities are becoming increasingly dependent on them (Baker, 2014; Tairo, 2015; World Bank, 2009). This dependency can have an impact on the dive industry, and was therefore considered important to assess.</p> <p>Coupled with population growth and coastal migration, is the increasing dependency on marine resources. This inevitably leads to degradation of the marine environment. This has links to economic and environmental risks (Hinrichsen, 2011; Richmond, 2011), and pertinent to address its impact on dive operators in the EAME.</p> <p>Unemployment in East Africa is on the rise. This social risk is correlated to rising crime, population growth, economic recessions and depressed local economic activity (Hofmeyer, 2013).</p>
<p>Question 21 What level of impact do the following international social risks have on your dive operation?</p> <ul style="list-style-type: none"> • Global disease epidemics (ebola virus, cholera, zika virus, etc.) • International crime (terrorism, piracy, etc.) 	<p>While this research has been addressed in the EAME countries, there is a need to understand its effect on the dive tourism industry. By taking the most common risks, the researcher’s aim was to test these in the context of the impact such risks would have on dive operators in the EAME. By determining the level of impact, the researcher could assess the extent to which these risks would impact dive operators. Based on literature, it was deemed important to assess if the following risks emerged in this research:</p> <p>In recent years, disease epidemics have affected the tourism industry. The Ebola virus hit the African tourism industry particularly hard (Poletto et al., 2014), and it was thus necessary to ascertain the level of impact these events would have on the dive operator and dive industry in the EAME.</p> <p>Terrorism threats and incidents have been on the rise over the years and al-Shabaab has impacted</p>

<ul style="list-style-type: none"> • Coastal migration (cross-border human movement) 	<p>on tourism in the East African region (Pflanz, 2014). The tourism industry in Kenya, for example, has been severely affected by cross-border crime and it was deemed important to determine the level of impact this may have on the region's dive industry.</p> <p>Migration of people across borders has increased over the past decade. Migrants are moving to areas with better prospects. Coastal migration can also be linked to increased demand on marine ecosystems, leading to degradation of coral reefs, resulting in economic impacts (Baker, 2014; Corcoran et al., 2010; Tairo, 2015). Since dive operators could be affected by growing coastal populations it was necessary to investigate this.</p>
<p>Question 22 In your opinion, would these social risks influence the decision for dive tourists to travel to your country/region?</p>	<p>Population growth and human movement is reshaping the African landscape. As more people congregate to areas of opportunity, factors such as crime, unemployment and diseases increase. In the case of the EAME region, there are many cases of social imbalance which disrupt business environments, making this is an important consideration of the study.</p>
<p>Section 11: Political risks – Booth, 2015; Henderson, 2007</p>	
<p>Question 23 What level of impact do the following domestic political risks have on your dive operation?</p> <ul style="list-style-type: none"> • Political instability • Government corruption • Lack of service delivery • Civil unrest and/or strikes 	<p>Literature indicates that domestic political external risks affect businesses. It was therefore important to see if this emerged from this research. Political risks are characterised as the most disruptive to business in Africa (Booth, 2015). By determining the level of impact, the researcher could assess the extent to which these risks would impact dive operators:</p> <p>Political instability is often associated with crime, violence, corruption and unsavoury business practices and is more often than not characterised by a fear of the unknown (Fin24, 2017a; Fin24, 2017b; News24, 2017; OSAC, 2015; WPR, 2016). Political insability has come to the forefront of the risk discussion recently and it was important to determine how this would impact small tourism businesses along the EAME.</p> <p>Santana-Gallego et al. (2016) posit that an atmosphere rife with corruption imposes a burden on society. High levels of government corruption are reported in South Africa, as an example. The degree by which this would impact on dive operators needed to be addressed.</p> <p>Major shortcomings of service delivery are: inadequate infrastructure, lack of government intervention, and insufficient travel information at destinations (Chen and Chen, 2016). Service delivery issues are experienced in the EAME (Rampa, 2011) (Chen et al, 2014). Such situations could disrupt small businesses and it was deemed important to assess if this would impact on dive operators.</p> <p>A catalyst for civil unrest can be attributed to grievances in areas inhabited by marginalised groups, generally as a result of perceived inequalities over sharing of resources (Must and Rustad,</p>

<ul style="list-style-type: none"> • Lack of and restrictive MPA regulations 	<p>2016). Such situations could disrupt small businesses and so the study assessed if this would impact on dive operators.</p> <p>MPA's function is to serve the best interests of the stakeholders of the marine environment (Done, 2001; Masud et al. 2017), however literature indicates that MPA's are not promoting the conservation agenda adequately. Pollnac et al. (2010) also indicate that MPA's are instrumental in providing sustainable benefits for marine-based tourism. Literature however indicates that MPA's lack effective management (Burke et al., 2011). It was therefore important to address the impact that lack of/restrictive MPA regulations may have on dive operators in the EAME.</p>
<p>Question 24 What level of impact on coral reefs do the following international political risks have on your dive operation?</p> <ul style="list-style-type: none"> • Neighbouring conflicts (wars, ISIS threat, etc.) • Regional political instability • Strict visa regulations (more difficult for dive tourists to enter country, unabridged birth certificates, etc.) • Travel restrictions (for example, US or EU issuing travel advisories as a result of terrorism threat, civil unrest, etc.) 	<p>Literature indicates that international political external risks affect businesses. It was therefore important to see if this emerged in this research. By determining the level of impact, the researcher could assess the extent to which these risks would impact dive operators.</p> <p>Neighbouring conflicts have plagued the region, creating negative perceptions (Rushby, 2015). Literature on recent geo-political events have highlighted that there is a need to address this risk and how it would impact on dive operators and the dive industry as a whole.</p> <p>Tourists are less inclined to travel to a country if there are regional political issues (News24, 2017; Wexler, 2015). The researcher felt it was an important to determine if political instability could affect dive tourists from visiting any of the four countries in the EAME.</p> <p>Inbound tourism to South Africa declined since strict visa regulations were implemented in May 2014 (Fin24, 2015). The implications of this on the tourism industry highlighted a key threat that needed to be addressed in this study.</p> <p>Travel advisories are often published as a measure to warn citizens travelling to foreign countries. Travel Alerts are usually issued for short-term unrest or immediate threats which could threaten the safety of the citizens of countries who issue such travel warnings (European Commission Consular Protection, 2017; Government of Canada, 2017; UK Foreign and Commonwealth Office, 2017; U.S Passports and International Travel, 2017). These advisories could reduce dive tourists travelling to the region and it was deemed important to assess the level of impact this would have.</p>
<p>Question 25 Do you feel these political risks would influence a dive tourist's decision to travel to the region?</p>	<p>In Africa, political risks are currently seen as one of the most debilitating type of risk to tourism growth, and this has been well documented (Aon, 2015; Carter, 2008; Lepp and Gibson, 2008). Given the impact addressed in literature, it was important to determine to what extent dive tourists would defer or change their travel plans to visit countries with high levels of political risks.</p>

Section 12: Risk categories

<p>Question 26 Which risk category do you feel has the biggest impact on your dive operation presently?</p>	<p>At this point, the researcher felt that the dive operator needed to take a step back after having considered all the external risks in the previous sections to answer this question, which was to provide an overall view of which risk category currently has the biggest impact on dive operator's businesses. This data was needed because it allowed the researcher to provide a view of which external risks were most impactful and most prevalent in the EAME with the use of risk radars and country comparison maps.</p>
<p>Question 27 Which risk category do you feel will have the biggest impact on your dive operation in future?</p>	<p>Similarly, the researcher felt that the dive operators were able to provide their point of view of what external risks they expected to impact on their dive tourism businesses in future. The importance of this question was to assess the future outlook of the dive industry given that these external risks are currently present. This leads to the next question which considers adaptation strategies.</p>
<p>Question 28 In conclusion, given the above risks, have you considered any adaptation strategies to ensure the long-term viability of your dive operation?</p> <ul style="list-style-type: none"> • Have not looked into it • Have found no solutions to these risks • Have considered adaptation strategies but not implemented any • Have implemented some strategies to mitigate some risks • Have applied sufficient strategies to ensure long-term viability of my dive operation 	<p>Although many external risks are considered beyond the control of management, the researcher wanted to assess to what degree dive operators were able to protect their businesses from these external risks, and if they had indeed applied strategies to mitigate such risks.</p>

Appendix E: Marine protected areas (MPAs) in the EAME

KENYA				
Site Name	Designation	Size (km²)	IUCN Category	Year established
Kiunga	Marine National Reserve, UNESCO Biosphere Reserve	600	VI	1980
Malindi	Marine National Park	6.3	II	1968
Malindi – Watamu	UNESCO Biosphere Reserve	177	VI	1968
Watamu	Marine National Park	32	II	1968
Mombasa	Marine National Park	10	II	1986
Mombasa	Marine National Reserve	200	VI	1986
Diani	Marine National Reserve	75	VI	1993
Kisite	Marine National Park	28	II	1978
Mpunguti	Marine National Reserve	11	VI	1978
Wasini	Locally Managed Marine Area	39	-	1973

TANZANIA				
Site Name	Designation	Size (km²)	IUCN Category	Year established
Unguja (Zanzibar Island)				
Chumbe Island Coral Park	Marine Sanctuary and Forest Reserve	0.30	II	1991
Menai Bay	Marine Conservation Area	470	VI	1997
Misali Island	Conservation Area	22	VI	1998

Mnemba Island	Marine Conservation Area	0.15	VI	2002
Kiwengwa	Marine Controlled Area	17.50	-	2000
Pemba Island				
Pemba Channel	Marine Conservation Area	-	-	2005
Misali Island – Pemba Island	Marine Conservation Area	21.60	VI	1998
Ngezi Forest – Pemba Island	Forest Reserve (Including coastal zone)		-	1959
Mainland Tanzania				
Tanga collaborative Management Area	Forest Reserve (Mangrove)	1598.50	-	1996
Saadani	National Park	70	-	1969
Maziwe Island	Marine Reserve	2.60	II	1981
Mnazi Bay – Ruvuma Estuary	Marine Park	650	VI	2000
Dar es Salaam Reserves	Marine Reserves	26	II	1975
Mafia Island	Marine Park	822	VI	1995
Nyororo, Shungumbili and Mbarakuli	-	-	-	2007

MOZAMBIQUE				
Site Name	Designation	Size	IUCN	Year

		(km ²)	Category	established
North Quirimbas	Private	230	-	2008
Quirimbas Archipelago	Marine National Park	1522	IV	2002
Premeiras and Segundas	Environmental Protection Area	43000	-	2012
Vilanculos	Marine National Park	80	-	2000
Bazaruto	Marine National Park	1430	II	1975
Ponta do Ouro	Partial Marine Reserve	678	IV	2008

SOUTH AFRICA				
Site Name	Designation	Size (km ²)	IUCN Category	Year established
iSimangaliso Wetland Park includes: Maputaland	World Heritage Site Marine Protected Area Marine	3280 408	II IV	2007 1986
St Lucia	Marine Reserve and Sanctuary	414	IV	1979
Tongaland turtle beaches and coral reefs	RAMSAR Site	395	-	1986

Appendix F: Accompanying CD of values

Appendix G: United Nations Sustainable Development Goal 14

- **Conserve and sustainably use the oceans, seas and marine resources for sustainable development** (United Nation’s Sustainable Development Goal 14, 2017). The increasingly adverse impacts of climate change (including ocean acidification), overfishing and marine pollution are jeopardizing recent gains in protecting portions of the world’s oceans.
- Global trends point to continued deterioration of coastal waters owing to pollution and eutrophication (excessive nutrients in water, frequently a result of run-off from land, which causes dense plant growth and the death of animal life from lack of oxygen). Of the 63 large marine ecosystems evaluated under the Transboundary Waters Assessment Programme, 16 per cent of the ecosystems are in the “high” or “highest” risk categories for coastal eutrophication. They are located mainly in Western Europe, Southern and Eastern Asia, and the Gulf of Mexico.
- Ocean acidification is closely linked to shifts in the carbonate chemistry of the waters, which can lead to a significant weakening of the shells and skeletons of many marine species (such as reef-building corals and shelled molluscs). Studies of marine acidity at open ocean and coastal sites around the world have indicated that current levels are often outside preindustrial bounds.
- Overfishing reduces food production, impairs the functioning of ecosystems and reduces biodiversity. The proportion of world marine fish stocks within biologically sustainable levels has declined from 90 per cent in 1974 to 68.6 per cent in 2013. However, the trend has slowed and appears to have stabilized from 2008 to 2013.
- Small-scale fisheries face numerous challenges. In response, about 70 per cent of the respondents to a survey representing 92 countries and the European Union have introduced or developed regulations, policies, laws, plans or strategies specifically targeting small-scale fisheries.
- When effectively managed and well resourced, marine protected areas are important mechanisms for safeguarding ocean life. In 2017, protected areas cover 13.2 per cent of the marine environment under national jurisdiction (up to 200 nautical miles from shore), 0.25 per cent of the marine environment beyond national jurisdiction and 5.3 per cent of the total global ocean area.

Appendix H: Editor's letter

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To whom it may concern

This is to certify that I, Alexa Kirsten Barnby, a language practitioner accredited by the South African Translators' Institute, have edited the master's dissertation of the degree of MASTER IN COMMERCE titled "External risks impacting on the scuba diving industry in the East African Marine Ecoregion" by Dimitri Dimopoulos.

The onus is, however, on the author to make the changes and address the comments.

