

**The Influence of Natural Disaster in Tourism in Mozambique: A Case Study of
Zambezi Valley Region**

by

**MAGUMANE Anastácio Rafael
51220617**

September, 2022

**Master's Thesis Presented to
Ritsumeikan Asia Pacific University
In Partial Fulfilment of the Requirements for the Degree of
Master of Asia Pacific Studies / International Cooperation Policy**

Table of Content

List of figures.....	iv
Certification Page	v
Acknowledgements.....	vi
Dedicatory.....	vii
Abstract.....	viii
CHAPTER ONE	1
1. INTRODUCTION	1
1.1 Background Information.....	1
1.2 Research question/focus	4
1.3 Specific research objectives.....	7
1.4 Significance of the study.....	8
CHAPTER TWO	10
2. Literature review	10
2.1 Introduction.....	10
2.1.1 Natural disaster	10
2.1.2 Natural Disaster and Tourism	12
2.1.3 Tourism in Mozambique.....	14
2.1.4 Natural Disaster in Mozambique	18
2.1.5 Types of natural disasters in Mozambique	22
2.2 ZAMBEZI VALLEY REGION (CASE STUDY)	25
2.2.1 Physical description of the study region	25
2.2.2 Potential of the Zambezi Valley region	26
2.2.3 Population of the Zambezi Valley	26
2.2.4 Tourism in the Zambezi Valley Region.....	27
2.2.5 Natural disaster in the Zambezi Valley Region	30
2.3 Theoretical Summary of natural disaster and tourism in Mozambique.....	31
CHAPTER THREE.....	33
3. Research methods	33
3.1 Introduction.....	33
3.2 Data collection	35
3.3 Data from existing literature	35
3.4 Interviews.....	35
3.5 Data analysis	37
3.5.1 Data Categorization	38
3.6 Recommendations.....	39
CHAPTER FOUR.....	41

4. Findings	41
4.1 Introduction.....	41
4.2 Geographic location and frequency of natural disasters in the Zambezi Valley region	42
4.3 Infrastructure and volatility of tourism support services	45
4.4 Institutional cooperation and natural disaster response in tourism.....	47
4.5 Information sharing and dissemination.....	49
CHAPTER FIVE	51
5. Discussion.....	51
5.2 The natural conditions	51
5.3 Society's structure.....	54
5.4 Institutional Integration.....	57
CHAPTER SIX	60
6. Conclusion, recommendations and limitations	60
6.1 Conclusion	60
6.2. Recommendations.....	62
6.2.1 Preparedness and mitigation	62
6.2.1.1 Understanding the risk of natural disasters in tourism	62
6.2.1.2 Planning and Prioritizing	63
6.2.1.3 Preparedness and mitigation	64
6.2.2 RESPONSE	64
6.2.2.1 Response and Recovery Measures.....	64
6.2.3 RECOVERY	64
6.2.3.1 Long-term Resilience.....	64
6.3 Limitations	65
7. References.....	66
7.1 Appendices.....	1

List of Tables

Table 1. Total number of tourist 2015-2019	16
Table 2. Tourism direct contribution to GDP 2015-2019	16
Table 3. Tourism contribution in GDP 2008-2014	17
Table 4. Total jobs generated by tourism 2015-2019	17
Table 5. Total tourism revenue 2015-2019	17
Table 6. Natural disasters with major impact in Mozambique 2010-2020	20
Table 7. Total number of tourists in Zambezi Valley 2015-2019.....	29
Table 8. Total of natural disasters in Zambezi Valley Region 2013-2020	31
Table 9. List of respondents.....	36

List of figures

Figure 1. Probability of occurrence on natural disaster in Mozambique per year	24
Figure 2. Population of Zambezi Valley Region by region 2021	27
Figure 3. Total number of international tourist in Zambezi Valley Region 2015-2019	29
Figure 4. Total of national tourist Zambezi Valley Region 2015-2019.....	29
Figure 5. Total number of tourist Zambezi Valley Region 2015-2019	30
Figure 6. Natural disaster risk assessment in tourism.....	33
Figure 7. Tourism disaster vulnerability framework	38
Figure 8: Data analysis methodology outline.....	40

Chart 1. Total number of natural disasters by type in Mozambique 2000-2020	24
---	----

Map 1. Geographical location Zambezi Valley Region.....	25
Map 2: Area of study within the country	44

Certification Page

I, **MAGUMANE Anastacio Rafael** (Student ID 51220617) hereby declare that the contents of this Master's Thesis / Research Report are original and true, and have not been submitted at any other university or educational institution for the award of degree or diploma.

All the information derived from other published or unpublished sources has been cited and acknowledged appropriately.

Anastácio Rafael Magumane

MAGUMANE, Anastacio Rafael

2022/07/22

Acknowledgements

First of all, I thank God for the gift of life and health that has been so generously granted to me, even in an era of unprecedented uncertainty due to the Covid-19 pandemic.

Secondly, I would like to thank JICA, the ABE Initiative, for creating the scholarship program in African countries. This has allowed me to expand my horizons and acquire scientific knowledge that will benefit my country's development efforts.

My sincere appreciation and admiration are owed to Professor Yotsumoto Yukio, my supervisor, mentor, guide, for the support, guidance, and selfless availability in all phases of the preparation/elaboration of this research. This will forever be a positive milestone in my academic and professional life.

Gratitude is extended to Benjamim Anselmo de Araujo Portugal (Bejo) for his assistance in locating and scheduling interviews with stakeholders (public managers from the tourism and disaster management sectors) in the Zambezi Valley region, and for our sense of brotherhood that, even though we are in different regions, our coexistence has the same flavour and fluidity as it would be in our own home.

My biggest thanks are extended to my interviewees (public managers of tourism, natural disaster management in Tete, Manica, Sofala, and Zambézia, and officers of Zambezi Agency strategic studies) for the information provided, without whom this research would not have the same depth and significance. The time they provided to me was precious, and despite our demanding professional responsibilities, we were able to have fruitful conversations and learn a lot from one another.

It's my pleasure to thank my classmates for their excellent experiences shared during these two years of training. Your friendship will always be cherished by me.

Finally, I would like to extend my thanks to everyone who directly or indirectly contributed to this academic journey, but who for some reason was not mentioned individually. Thank you for your time and I hope we will cross paths again in the future for academic and professional challenges.

Dedicatory

My work is dedicated to my parents Rafael Magumane (in memory) and Hilaria Uachela for their support and belief that education is the basis for a person's progress in life.

Dedicated to my daughter, Leana Caetana Rafael Magumane, for inspiring me to pursue this academic achievement.

The struggle continues

*'Improving community knowledge of tourism
resilience is the central prerequisite for enhancing
community participation in tourism development'*

Gianna Moscardo

Abstract

Throughout the world, cyclones and floods are the natural disasters that impose the greatest burdens on the challenges and efforts of many countries, particularly Mozambique, undertaking work to promote socioeconomic and sustainable development. In the Zambezi Valley region, influenced by its geographical location (coastal area of the Indian Ocean and the Zambezi River), it has been observed recently, from 2015 to the present day, an increase in the frequency and intensity of environmental phenomena with devastating effects that pose significant barriers to the development of regional tourism. The objective of this study was to assess the influence of natural disasters (cyclones and floods) on tourism in the Zambezi Valley region based on their frequency and intensity.

This case study employs an exploratory approach based on the collected data, which focuses on the perspectives of content analysis and narrative analysis. By employing this method, the interviewees' experiences were explored in relation to the problem under investigation. It was concluded in the study that the Zambezi Valley region is particularly prone to cyclones and floods, a situation that was aggravated by the absence of intra and inter-institutional coordination for improving tourism resilience in the face of natural disasters. Consequently, there is an increase in vulnerability and effects of natural disasters. This results in a spill over effect on tourism as local tourism operators and visitors abandon the region and move to regions less susceptible to natural disasters and have more robust disaster management systems.

Keywords: natural disaster; tourism, exposure, vulnerability, sustainability, and resilience

CHAPTER ONE

1. INTRODUCTION

1.1 Background Information

It is widely recognized that tourism is one of the most significant contributors to the global economy, changing the lives of millions of people across the globe, and causing significant social, economic, and cultural changes (Dias and Cassar, 2005). Given that the sector's functions include activities from many different sectors, its ability to create jobs, income, and improve the well-being of populations is complex (Levi, 2012). As one of the world's top sectors, tourism is considered in many areas as a primary sector that can stimulate development and economic growth by providing opportunities for poverty alleviation and self-governance, especially in regions where limited resources are accessible and livelihood options are limited (Nguyen et al., 2015).

Additionally, Simpson et al., (2007) declared that tourism is a significant contributor to poverty alleviation, largely because it creates jobs and offers entrepreneurs opportunities, and also the recognition that this sector plays an integral role in poverty alleviation has made it a significant part of international trade and development. The Sub-Saharan Africa's GDP growth is predicted by 60% between 2018 and 2029, in part due to direct travel and tourism (World Travel & Tourism Council, 2019), and consequently the tourism industry is considered to be a significant source of development for the region (Musavengane et al., 2020).

Tourism in Mozambique has been shaped by three main topics: beaches, fauna, and the vibrant urban environments offered by the country's cities. The country has a number of national parks and reserves, national and special reserves, and wildlife reserves that rank among the most impressive in southern Africa (Gov. of Mozambique, 2017). Mozambique's tourism sector is recognised for its contribution towards maintaining a sustainable economic equilibrium by the Southern African Development Community (2019), which states that it ranks 122 out of 136 countries in the world tourism rankings and is a top seven sector in the

Southern African region, receiving about 78% of international tourists each year and accumulating 85% of the regional tourism revenue.

National Bureau of Statistics (2018) reports that the country received a total of 2.8 million tourists in 2018, an increase of 3.8% over the previous year, totalling USD 241.8 million in revenue and employing about 64,600 individuals. The consistence, confirm the observations of Simpson et al., (2008) in that tourism provides a major source of foreign exchange earnings in 46 out of 50 of the world's least developed countries. Although tourism is a highly climate-sensitive economic sector due to its close connections to the environment and climate, similar to agriculture, insurance, energy and transportation (World Tourism Organization and United Nations Environment Program, 2008).

It is widely accepted that tourism contributes to the promotion of sustainable development in the world economy, but its development is susceptible to a variety of adverse factors, notably natural disasters (Ma et al., 2020). As noted by the Intergovernmental Panel on Climate Change (2018), floods, cyclones, droughts, earthquakes, and other environmental hazards continue to cause millions of deaths, hundreds of thousands of injuries, and billions of dollars in economic damage each year around the world. It is obvious that the vulnerabilities of the tourism sector to natural disasters are unique and particular, since the industry is the largest consumer of local infrastructure (transportation, water supply, energy resources, communications, etc.), and their disruption has devastating and negative repercussions on tourism in both the short and long term, and can damage the image of the destination (Nguyen et al., 2015). As Dayton-Johnson (2006), stated, natural disasters pose a significant risk to the poor and threaten to eradicate all development gains in developing countries as well as accumulated wealth.

According to the United Nations (2012), Mozambique is one of the most vulnerable countries to natural disasters in Africa and ranks 174 out of 188 countries for per capita greenhouse gas emissions. The Ministry of Foreign Affairs of the Netherlands (2018) distinguished Mozambique as 160th out of 181 countries in regard to its vulnerability to climate-related disasters. It also is stated in The World Bank's (2019) report that Mozambique has five of the six vulnerability hazards present in African countries, which are: droughts,

which affect 600,000 people, and income losses, which cost about \$20 million each year; flood affects 185,000 people and approximately 3500 education, health, and tourism facilities; a landslide damages 100 people and causes \$1 million in damage to buildings; earthquakes cause 70000 deaths in 25 years and cyclones impact over 2 million people and approximately 9340 educational, health, and tourism places. The United Nations (2012) estimates that natural disasters and their consequences cause Mozambique to lose between 3 and 5% of its Gross Domestic Product annually.

Each year, about twelve tropical cyclones are formed in the Southwest Indian Ocean basin, with about 25 percent making landfall of flooding and cyclones accounting for about 35 percent of all damages and losses, in Madagascar and Mozambique (World Bank, 2016). By assessing vulnerability in six life-sustaining sectors such as food, water, ecosystem service, health, human habitat, and infrastructure, vulnerabilities can be determined about a country's exposure, sensitivity, and ability to cope with natural disasters, and generally, readiness is determined by the ability of a country to leverage investments and translate them into adaptation actions by considering its economic, social, and governance resiliency (Ministry of Foreign Affairs of Netherlands, 2018).

With a surface area of 2,660 km², 52 million m³ of fresh water, and 2 million hectares of biodiversity (flora and fauna), the Zambezi Valley region is one of the world's largest fresh water reservoirs. In line with a statement by the Mozambican government (2017), the lush natural landscape, the sandy beaches, crystal clear water suitable for swimming and diving, coral reefs of exceptional beauty, as well as a diverse ecosystem of fish, plants and, most importantly, fauna of the Zambezi Valley region, make it an ideal location for tourism development. Although the region offers a number of attractive tourist attractions, it is also at risk of natural disasters, given that 85% of storms, 46% of floods, and 35% of droughts occur throughout the country. In light of this, the United Nations Migration Agency (2012), considered the region to be seven times more exposed to extreme weather events in comparison to other regions within Mozambique.

1.2 Research question/focus

A number of disasters have affected tourist destinations internationally over the last two decades. Several adverse events, including floods, cyclones, and the Indian Ocean tsunami, adversely impacted international tourism. Considering that tourism is an economic activity most heavily influenced by the image of the destination, the performance of the tourism industry may be adversely affected by negative images of a destination (Rindrasih et al. 2019). The number of domestic tourists worldwide, on average, remains virtually the same despite natural calamities resulting from climate change. However, individual countries may experience dramatic changes with rapid growth over time. Current trends indicate that, according to Mishev and Mochurova (2008), colder countries will experience an increase in domestic tourism, while warmer countries will experience a decline.

Regarding this, there has been an increase in the number of deaths caused by natural disasters worldwide where low-income countries have a higher death rate than other countries (Genc, 2018). As a result of a natural disaster, buildings, such as houses, hospitals, schools, factories, etc., may sustain severe damage, and people have more difficulty coping with their daily lives and needs, which results in decreased motivation to engage in economic activities for fear of losing their loved ones or properties (Genç, 2018). There has been a steady increase in tourism industry growth year by year and it has become one of the main drivers of economic development in numerous countries. Due to a lack of preparedness and knowledge on the part of tourism, as well as an insufficient hazard and vulnerability assessment based on local conditions (Le Masson & Kelman, 2011) and limited integration of tourism with national disaster management systems (Matusin et al., 2019), make tourism vulnerable to natural disasters.

Climate change will inevitably increase natural disaster intensity over the next few decades, making the tourism industry and tourist destinations more susceptible to these phenomena. When natural disasters occur, the number of international tourists tends to decrease, since international tourists usually prefer destinations that offer them a chance to relax. During the presence of a natural disaster threat or an emergency situation in a touristic destination, tourists may consider alternative touristic locations to maximize the benefits

from tourism activity and therefore, the amount of income received by a destination decreases correspondingly to the decrease in the number of tourists arriving at the site, causing the severity of the damage that the location suffers in the case of a natural disaster to increase (Genç, 2018). Over the past few decades, natural disasters have been continuously causing damage worldwide, reaching \$142 billion annually, and a significant increase from the \$36 billion in the decades prior to 1994. According to Lopez et al. (2015), without adaptive measures, natural disaster damages will rise to \$185 billion each year as the economy and population expand.

It has become increasingly common for natural disasters to occur, and they have been occurring at an increasing rate as well. In developing countries, disasters have relatively greater effects than in developed countries. It is estimated that disasters take on an average 1% of the Gross Domestic Product (GDP) of low-income countries while they take on 0.25 percent of the GDP of high-income countries, although only countries with a particular level of development succeed in restoring their capital stock following a disaster (Bello et al, 2017). On the other hand, the United Nations report on natural disasters (2013) states that disasters pose a particular challenge to Least Developed Countries (LDCs) and Small Island Developing States (SIDS).

The devastation caused by disaster events in these states directly affects, or in some cases, totally destroys decades-long development gains. The cumulative effects of a loss of three to five percent of GDP in the least developed countries, such as Mozambique, every five to ten years have a notable adverse effect on development (United Nations, 2012). Disasters clearly set back social and economic gains, while highlighting the existing shortcomings and inequalities and putting strain on nations' budgets. Nations become increasingly vulnerable and exposed to disasters as more people and assets are situated in areas of high risk (United Nations, 2012).

In addition to poverty and weak institutional development, Mozambique is one of Africa's most vulnerable countries to climate-related hazards such as droughts, floods, and cyclones. These hazards, combined with low levels of development, are having a cumulative and devastating effect (Ministry of Foreign Affairs of Netherlands, 2018). According to the

World Bank (2020), it ranks as the 35th most vulnerable and the 24th least prepared country - meaning that it is at risk but unable to deal with the effects of natural disasters. In the central region of Mozambique, environmental hazards have increased substantially, resulting in an increased frequency and severity of floods (46%), droughts (35%), and cyclones (85%), putting 85% of the population at risk of natural disasters, and an increased vulnerability of the local economy (The UN Migration Agency, 2020).

In central Mozambique, the Zambezi Valley region has been hit by major natural disasters that have resulted in the destruction of human lives, economic activity, and infrastructure. Although the Zambezi Valley has tremendous potential, according to the report of the United Nations Migration Agency (2020), it has suffered seven times more natural disasters (floods and cyclones) than the rest of the country, which demonstrates the need to collect information regarding these phenomena and the impact they have on the local economy, as stated by Grimm et al. (2018), natural disasters have negatively affected many tourist destinations, where extreme events such as droughts, storms, heavy rainfall, hurricanes, cyclones, and so on have left many regions and global communities vulnerable to these events.

Hence, the Government of Mozambique (2017) has stated **that natural disasters present a serious risk to the Zambezi Valley region, which is accompanied by the destruction of tourism support infrastructures, mobility, and the well-being of its population from the regular occurrence of torrential rains which result in floods and severe tropical cyclones with average wind speeds exceeding 180 kilometers per hour.** Meanwhile, the poor development of social and economic infrastructure worsens the situation (Government of Mozambique, 2017). Also, this turns out regularly in a significant severity of impacts, which result in restrictions on access to roads, electricity, food, and the risk of waterborne illnesses such as malaria and cholera.

As discussed previously, natural disasters (cyclones and floods) have increased in intensity and frequency in the Zambezi Valley region, especially since 2015, with severe effects on social and economic infrastructure, as well as adverse effects on the environment. Aside from that, **poverty and a lack of ability of public institutions to respond to these**

adverse natural phenomena substantially hinder the development of economic activity locally. As tourism is an activity that is dependent upon the complementarity of other sectors to thrive, the rupture of such sectors is evident and tangible in the tourism sector, which is operating beyond its capacity.

It is as a result of these ruptures that the Zambezi Valley region has seen a **drastic and rapid decline in tourist's numbers from 87746 visitors in 2015 to 43353 in 2019**, which corresponds to a decrease of almost half of the foreign and domestic tourists who visited the region in 2015. In addition, **six natural phenomena of a high magnitude (3 cyclones and 3 floods)** were observed during the same period, which had detrimental effects on local infrastructure and livelihoods. Though the Zambezi Valley region offers a substantial opportunity for attracting domestic and international investment for the development of the tourism sector, it is imperative to acknowledge that natural disasters pose significant challenges in terms of social, economic, and sustainable development.

Taking this into consideration, the purpose of this study is to understand to what extent frequent, severe, and increasingly intense natural disasters negatively affect the tourism sector, and to look at the interdependence of the sector from an economic, destination, and local integration standpoint. In recognition of the fact that many scholars consider tourism to be a force that contributes to the growth of other sectors of an economy, Genç (2018) suggests that assessing potential damage due to natural disasters in tourism is a crucial step in preventing excessive death tolls and damage to property. In addition, Yee-Lee et al. (2012) suggest that tourism is one of the key elements of the economic development of small businesses and local communities, leading to increased revenue, which in turn increase infrastructure and services.

1.3 Specific research objectives

- 1.3.1 Identify the types of natural disasters that most affect tourism development in Mozambique
- 1.3.2 Describe the most frequent natural disasters impacting tourism in the Zambezi Valley region

- 1.3.3 Evaluate to what extent natural disaster influences tourism in the Zambezi Valley region
- 1.3.4 Identify the procedures used in the region to mitigate the effects of natural disasters in the Zambezi Valley
- 1.3.5 Propose resilient or sustainable measures to mitigate the impacts of natural disasters on tourism in the Zambezi Valley region

1.4 Significance of the study

The growth of tourism in Africa was higher in 2017, compared to the global average. There was an increase of almost 9% in tourist arrivals to 63 million and the amount of tourist receipts has increased by almost 8% to US\$37 billion. Growth in tourist arrivals continued into the first half of 2018. It was expected that international tourist arrivals for the year 2018 would increase by approximately 4.9%, as forecast by the United Nations World Tourism Organization. In 2017, tourism was a major economic driver of Southern Africa Development Community (SADC), one of the major value-adding industries in global and regional economies, and a labor-intensive industry that directly contributed around 2.8% of the total Southern African development community's (SADC) GDP. If indirect and induced impacts are taken into account, tourism contributed as much as 8%. Around 2.5 million jobs were directly dependent on this sector in the region in 2017, while in total, more than 6.3 million jobs were dependent upon the tourism sector (Southern African Development Community, 2019).

The Tourism Competitiveness Index ranks Mozambique 122 out of 136 countries in terms of global tourism competitiveness. In the Southern African Development Community, Mozambique is one of the top seven tourism-producing nations (others being Zimbabwe, Botswana, Mozambique, Mauritius, Namibia, and Tanzania), attracting more than 78 percent of all international tourists and accounting for nearly 85% of all tourism receipts. The average receipt per arrival for the Southern Africa Development Community in 2016 stood at US\$670, well below the global average of US\$1004 per arrival, however considerably above the average of US\$578 per arrival for the continent (Southern Africa Development Community - SADC, 2019).

In the Southern Africa region, where Mozambique is located, tourism represents a very significant economic and social component, with new destinations and attractions constantly being introduced to the tourism market, and existing destinations and attractions being developed and altered to meet the needs of a growing number of both international and domestic tourists. It creates new job opportunities and financial benefits for local communities. Although tourism has a tremendous capacity to propel economic development in destination areas, it is not without risks. Furthermore, it can also lead to a range of evident and potential problems, such as environmental, social, cultural, as well as political concerns in tourism destinations and cities. In light of the frequency of such events around the globe, it has become vital to study the effects of natural disasters on the development of tourism. The necessity to prepare, mitigate, respond, and build resilience can only be achieved by having a much better understanding of risks, vulnerabilities, and response capacity of community members, economic agents, and public policy makers.

The study - the first of its kind for the region of Zambezi Valley in Mozambique - will enable scholars, tourism managers at the regional and provincial levels, and universities to use as a source and for further research, as well as to guide the Zambezi Valley Development Agency in its efforts to promote sustainable local development with attention to tourism development specifically.

CHAPTER TWO

2. Literature review

2.1 Introduction

In order to better answer the research question under analysis, the purpose of this chapter is to present a review of relevant literature on the topic of natural disasters, preferably cyclones and floods in the tourism sector. The aim is to seek for answers through scientific assumptions, how tourism development has been influenced by natural disasters (floods and cyclones), assessing the existing reciprocity among the concepts. The literature review will be effectively guided by research objectives 1 and 2 which consist of (1) describing the natural disaster that affects tourism development in Mozambique and (2) identifying the most frequent natural disasters in the Zambezi Valley region. This chapter will discuss issues related to natural disasters in general, concepts, natural disasters and tourism, tourism and natural disasters in Mozambique and vice versa and finally the problematic influence of floods and cyclones on tourism in the Zambezi Valley region.

2.1.1 Natural disaster

According to Ivkov et al (2019), a natural disaster is an unexpected event outside of the control of the area affected (community or business), causing significant disruptions to the area's function and requiring additional resources (as opposed to those available in the area) to respond and recover from the events. Natural phenomena are responsible for these disasters, which can cause physical damage, loss of human lives and substantial damage to property. As result, natural disasters disrupt the lives of individuals as well as the economic activity of the affected region (United Nations, 2014).

Climate-related events are responsible for 91 percent of the natural disasters that occur throughout the world. These events include floods (43 percent), and cyclones (15 percent). Over 200 million people are affected by natural disasters every year, or approximately 3 percent of the entire world's population. Nearly 70,000 lives are lost as a result of these environmental phenomena (Breiling, 2016). Additionally, Genç (2018) notes that flooding and cyclones are rapid-onset disasters that are receiving the most attention due

to their large and visible costs, their sudden occurrence, and their difficulty in accurately predicting their magnitude or duration in advance, and similarly, the United Nations (2014) states that these events disrupt the living conditions of communities and individuals, as well as the economic activity of nations, because they are caused by a combination of two factors: (a) natural phenomena that have the potential to unleash processes, which cause damage or death to individuals and habitats, and (b) the vulnerability of individuals and human settlements.

Naturally occurring hazards may be conceptualized as the product of risk, exposure, vulnerability, and response, and naturally occurring hazards may become disasters due to the involvement of human social structures, especially vulnerable populations and infrastructure (Philips et al., 2015). The United Nations Disaster Risk Reduction reports that natural disasters have increased dramatically between 2000 and 2019, when compared to the previous two decades. Global economic losses from natural disasters have reached \$2.97 trillion (World Bank, 2020). Intensifying floods, storms, droughts, and heatwaves across the globe are likely to be linked to climate change and many scientific studies are now demonstrating the link between climate change and natural disasters (Lopez et al., 2015).

Natural disasters are continuously increasing in frequency and intensity as a result of climate change, urban migration, population growth, and shortages of natural resources (PricewaterhouseCoopers, 2013). These impacts and effects are significantly more pronounced in developing countries than they are in developed ones. Bello et al. (2017), in their turn, state that on average, disasters in low-income countries cost one percent of GDP, while in high-income countries the cost is reduced to 0.25 percent. It has been recorded that there have been 314 climate-related disasters on average each year since 2000, primarily storms and floods, which represents an increase of 44 percent over the 1994–2000 average (Centre for Research on the Epidemiology of Disasters, 2020).

The World Bank (2020) states that in 2019, approximately 396 natural disasters were verified worldwide. These disasters had an estimated \$130 billion in damage losses and an estimated 95 million people affected. As a result, these events had devastating economic, environmental, and social impacts (Banholzer et al., 2014), and much of the increase in losses

is attributable to the occurrence of climate-related catastrophes, including droughts, floods, and storms (World Bank, 2020). However, there is no global estimate of the economic damages caused by tourism. Lopez et al. (2015), refers that climate-related hazards increase the probability of natural disasters.

It is widely accepted that natural disaster risk is the expected cost of losses, expressed as the probability of occurrence of hazardous events multiplied by the effects (effects on lives and livelihoods, health, ecosystems, economies, societies, cultures, and infrastructure). This scenario occurs when three elements interact: (1) the hazard itself, (2) the population exposed to the hazard (exposure), and (3) the ability of the community to withstand the impact of the hazard (vulnerability) (Lopez et al., 2015). Global population has grown by 87 percent since 1970. As a result, the proportion of people who live in flood-prone areas increased by 114 percent and the number of people living in coastal regions that experience cyclones increased by 192 percent (United Nations Office for Disaster Risk Reduction, 2012), resulting in catastrophes that have enormous adverse effects on humans and the environment, especially in sectors that are closely related to climate, such as agriculture, tourism, and others.

2.1.2 Natural Disaster and Tourism

The tourism industry contributes significantly to the economic development of developing countries, while mature destinations such as the United States and Europe lead the world in travel exports, and as a leading sector of the economy for least developed countries (LDCs), tourism helps to create jobs and alleviate poverty (World Bank, 2020). Tourism, however, relies on a significant number of assets that are highly susceptible to environmental hazards. It is imperative to recognize that these assets are shaped by a wide array of factors and forces, including exogenous influences that are unrelated to the tourism industry. Examples of such exogenous influences include natural disasters or unexpected events. Therefore, they can have substantial negative effects on tourism flows since they have a profound impact on society and individuals alike. Theoretically, there are several reasons why natural disasters and unexpected events might influence tourist destination choice (Rossello et al., 2020).

Letho et al., (2008) define disaster as "a situation in which an enterprise (or group of enterprises in the case of a tourism destination) is confronted with sudden and unpredictable change that can affect them in a catastrophic manner over which it can do little or nothing". The consequences of natural catastrophes have historically been negative for the lives of many people. There has been a significant increase in the incidence of natural disasters worldwide over the past 20 years, resulting in higher damage and death rates in low-income countries (Genc, 2018).

It is understood that natural disasters include floods, cyclones, forest fires, and earthquakes, which cannot be accurately predicted, happen at any time and without prior warning, and have a domino effect on local industries (Estevão and Costa, 2020). There is no doubt that nature will always be with us, and tourism is a fundamental part of global economic activity (Beattie, 1992). In Peters and Pikkemaat (2006), the tourism sector and tourist destinations are susceptible to natural disasters, primarily floods and cyclones, whose intensity has been increasing significantly with climate change. These natural disasters decrease international tourism arrivals at tourist destinations around the world.

In Shepherd et al. (2013), the authors concluded that disaster effects are strongly determined by factors such as the type of hazard, existing vulnerability, and level of exposure to disaster events. The author added that natural catastrophes are likely to have an adverse effect on tourism businesses and destinations. This is due to the level of impact varying greatly depending on the market segment and geographic region. As cyclones and floods impact tourism in many parts of the world, and they are becoming more severe and frequent, it leads to disruptions of infrastructure as well as the tourism industry since tourism locations are exposed to natural disasters in all parts of the world, and with very short time for recovery between events (Ivkov et al., 2019).

According to Estevão and Costa (2020), flooding and cyclones result in significant human suffering, along with substantial physical and economic damage which may extend far beyond the immediate area of the disaster. Therefore, the consequences of flooding may extend to other areas of the country, whether temporarily or permanently, and their general economic development level. In light of the fact that tourists prefer a particular destination

in order to have a relaxing vacation, the presence of a natural disaster threat or the existence of an emergency condition in a tourism destination will encourage tourists to consider alternative tourist destinations in order to maximize the benefits of tourism (Genc, 2018). Essentially, natural disasters and tourism conjure up entirely different images in the mind. Tourism is associated with relaxation, recreation, pleasure, and pleasant surroundings, whereas natural disasters, on the other hand, invoke images of death, devastation, and tragedy. There appears to be a conflict between these two elements and, therefore, they are usually mutually exclusive rather than complementary, as tourism and the benefits it derives are frequently "victims" of natural disasters (Beattie, 1992).

Nguyen et al., (2015), in their turn, argue that tourism is a major source of income, investment, and employment for many countries, and The World Trade Organization (2005) demonstrates that tourism can contribute to the development of a country, economic growth, and the reduction of poverty and the empowerment of local communities, including resource-limited regions and those with limited livelihood opportunities. However, the World Bank (2020) points out that natural disasters can affect these sectors in a variety of ways, which then result in disruptions within the following sectors: wholesale and retail trade, transportation and storage, business services, real estate, finance, and others.

2.1.3 Tourism in Mozambique

Tourism is an important activity in industrialized societies, a phenomenon that brings together economic, political, social, and cultural aspects, presenting itself over the last few decades as one of the most promising world economic activities, generating jobs and foreign exchange. Tourism generates indirect activities which affect the most varied sectors of the economy, from industry to agriculture, such as the generation of employment, distribution of income, attracting foreign exchange, and providing an improvement in the quality of life of local communities, since it constitutes a constructive part of a sustainable development process (Da Silva, 2004). In its turn, Gemo (2017), states that tourism is a constantly growing economic activity worldwide and in developing countries, has made a major contribution to poverty alleviation through the enhancement of natural resources and historical and cultural, and cultural heritage that contribute significantly to promoting investment and employment,

as well as generating revenue in foreign currency. Due to its cross-cutting nature, it stimulates other sectors of activity, thus contributing to the efforts to diversify the economy. Since 1999, the World Tourism Organisation has been promoting tourism as a fundamental tool in the fight against poverty in developing countries (Da Silva, 2019).

The importance of tourism has been recognized by both developed and developing countries for the way in which it has stimulated investment and modified the land use and economic structure of countries through the generation of wealth and employment, involving the most diverse professions in the world. Developing countries see tourism as a source of foreign exchange earnings, a priority in the direction of investment and national economic outlet to the first world, as a result of the economic advantages attributed to it and positive contribution to the countries balance of payments (Da Silva, 2004). In Mozambique, the nomination of priority areas for tourism development by the Government shows great expectations from the tourism sector to participate in the development, firstly of the areas of tourism potential and then of the country in general. The potential for tourism development in Mozambique is interesting and diversified to become a tourist destination at the regional (Southern Africa Development Community) and international level, due to its competitive advantages.

Mozambique is rich in natural resources, with more than 5,500 plants, 220 mammals, and 690 species of birds, most of them endemic. The main tourist attractions are concentrated along the coastline, with more than 2700 km of beaches with crystal clear water, palm trees, lagoons, islands and archipelagos, coral reefs on the extensive Mozambican coast, national parks and reserves that have been repopulated over time, as well as the Arab-African and Portuguese influence in the gastronomy of the country's major cities (Ministry of Culture and Tourism, 2015). Mozambique enjoys competitive advantages based on its geographical and strategic location, the quality of its natural resources due to their preservation, and the uniqueness of its historical and cultural heritage, which provide unique opportunities and motivations for travel by various tourists in seeking for leisure tourism in the tropical environment, beaches, fauna, culture, and business-driven by the boom in the exploitation of natural resources (coal and gas).

According to Mozambique National Institute of Statistics (2020), from 2015 to 2019, Mozambique received a total of 10,856,561 tourists. Therefore, it is estimated that 1,090,561 of these tourists are domestic and 9,766,000 internationals, contributing 2.8% of the Gross Domestic Product each year, a decrease of 82% if compared with the sector's annually contribution over the period 2008 to 2014. It is also estimated that the tourism sector employed about 1,353,900 people in the same period, of which 60.4% of the local workforce are women (Mozambique National Institute of Statistics, 2020).

Table 1. Total number of tourist 2015-2019

Year	Number of International tourists	Number of domestic tourists	Total number of tourists
2015	1 634 000	257 031	1 891 031
2016	1 715 000	207 987	1 922 987
2017	1 514 000	196 989	1 710 989
2018	2 870 000	205 315	3 075 315
2019	2 033 000	223 239	2 256 239

Source: Mozambique National Institute of Statistics 2020

Table 2. Tourism direct contribution to GDP 2015-2019

Year	Tourism contribution (GDP) (\$billions)
2015	0.6
2016	0.4
2017	0.4
2018	0.5
2019	0.5

Source: Mozambique National Institute of Statistics 2020

Table 3. Tourism contribution in GDP 2008-2014

Year	Tourism contribution (GDP) (\$billions)
2008	2.2
2009	2.4
2010	5.6
2011	2.8
2012	2.2
2013	2.1
2014	2.0

Source: Mozambique National Institute of Statistics 2020

Table 4. Total jobs generated by tourism 2015-2019

Year	Number of Employees
2015	307 600
2016	254 000
2017	256 000
2018	262 000
2019	273 000

Source: Mozambique National Institute of Statistics 2020

Table 5. Total tourism revenue 2015-2019

Year	\$ Million
2015	202
2016	114
2017	164
2018	331
2019	324

Source: Mozambique National Institute of Statistics 2020

According to the Ministry of Land, Environmental and Rural Development (2019), the Government of Mozambique recognizes the strategic importance that the tourism sector has to boost development, having as main attractions the sustainable development and conservation of natural, cultural, and social heritage through the promotion of diving, beach, conservation and adventure tourism, cultural and business fairs. However, tourism development in terms of tourism establishments and activities in the country has not followed a planned pattern, presenting itself in a disorganized manner, which provides exposure and vulnerability to extreme events, as well as challenges to the implementation of sectoral laws and regulations.

Among the various challenges facing the tourism industry in Mozambique, three deserve to be highlighted as they are key to improving the national image and thereby increasing the number of international tourists, mainly whom demand a reasonable standard of infrastructure and tourism services:

- Lack or insufficient quality of infrastructure, public and private services that can support regular flows of tourists;
- Lack of transport and complementary tourist services that would make it possible to present a tourist pole organized into "cluster" scenarios;
- The road network is poor and does not facilitate the distribution of basic goods and is not serving adequately the tourist destinations of national reference.

2.1.4 Natural Disaster in Mozambique

Mozambique is a disaster-prone country. It suffers an average of 1.17 major disasters per year and is regarded as one of the most disaster-prone in Africa (National Institute for Management and Disaster Risk Reduction, 2012). It is in this context that the Director Plan for Disaster Risk Reduction in the last 30 years, emphasises that at least 14% of the population has been affected by a flood, cyclone, drought, or earthquake and more than half of these events resulted in disaster (53%). In this context, the Council of Ministers of the Republic of Mozambique (2017), considers Mozambique the 10th most vulnerable country to disaster risk in Africa. The vulnerability to natural disasters results from its location at the convergence of nine international rivers, and in the intertropical convergence zone subject to

excessive moisture gains and losses, with a 2700 km long coastal zone suffering from tropical cyclones. However, according to the Ministry of State Administration and Public Service of Mozambique (2017), extreme events and natural disasters are a global concern.

Population increase, rapid urbanization without following basic principles of land use planning, has influenced the increase in the level of vulnerability to natural disasters of billions of people in the world. Developing countries like Mozambique are more exposed to natural disasters, given their limited response capacity. On average 13 times more people die in poor countries from disasters than in rich countries and damage costs up to 1 percent of Gross Domestic Product (GDP) (United Nations Office for Disaster Risk Reduction, 2012).

National Operational Centre for Emergencies (2021), refers that, Mozambique's vulnerability to natural disasters, especially tropical cyclones and sometimes heavy rains accompanied by strong winds, creating floods and inundations in areas bordering watercourses, coastal zones and cities, and towns, has the destructive effect of social and economic infrastructures, as well as creating impassable situations on most national roads. It was in this concern with the frequency and intensity of natural disasters that Mozambique's President Filipe Nyusi, at the High-Level Virtual Dialogue on COVID-19 Emergencies and Climate Change in Africa held in April 2021, noted that Mozambique is among the most vulnerable countries to natural disasters, noting that extreme weather events that were once rare are now increasingly frequent and intense. As stated by the country's President "*We suffer prolonged drought, intense heat, floods, cyclones and other associated factors such as rising sea levels, saltwater intrusion, and wildfires, resulting in damages, among losses of thousands of human lives, public and private infrastructures such as health facilities, schools, roads, bridges, power transmission networks, and homes*".

In the last 50 years, Mozambique has been hit by about 75 natural disasters that caused the destruction of economic and social infrastructure, killing more than 120,000 people and affecting about 20 million people (Ministry of State Administration and Public Service of Mozambique (2017). Thus, the national statistical deficit does not allow for the exact measurement of the social, economic, and environmental impacts of natural disasters, although the Disaster Risk Reduction Indicators Framework of Ministry of State

Administration and Public Service of Mozambique (2017), for each extreme event, the country loses between 1-5% of its Gross Domestic Product. This was supported by the World Bank (2019), when it indicated that Mozambique's vulnerability to natural disasters would imply a loss of 4-14% of annual GDP to natural disasters in the coming years.

The National Emergency Operating Centre (2021), reports that Mozambique loses about USD\$150 million annually due to the occurrence of natural disasters. In 10 years, i.e., from 2010 to 2020, Mozambique had (10) natural disasters of great magnitude, an average of one natural disaster per year, of which (7) seven cyclones and (3) floods, affecting more than 3.5 million of people and killed more than 2.5 thousand and by that causing huge economic losses in the total or partial destruction of social and economic infrastructures. The geographic location of Mozambique constitutes one of the main strengths, associated with the arrangement of the relief is also an important vulnerability factor since the country is subject to the influence of the Mozambique Channel, responsible for the occurrence of adverse situations such as cyclones, floods, and droughts which has jeopardized the investments made in infrastructure in general and in tourism facilities in particular, putting at risk investments and the development of the sector (Da Silva, 2019).

Table 6. Natural disasters with major impact in Mozambique 2010-2020

Year	Name of natural disaster	Number of affected people	Number of people killed	Infrastructure damages in US\$
2012	Dando tropical storm	100 000	44	69 000
2013	Flood	240 000	112	25 000
2014	Helen cyclone	10 000	*	*
2015	Flood	400 000	65	*
2017	Flood	79 000	44	*
2019	Idai cyclone	1 500 000	2000	2.9 billion
2019	Kenneth cyclone	800 000	2000	*
2020	Eloise tropical storm	36 000	27	*
2020	Chalene cyclone	74 000	35	*
2020	Guambe cyclone	27 000	36	*

Source: Ministry of State Administration and Public Service of Mozambique, 2017. *
Unavailability of data at the date of compilation of information.

The central region of Mozambique faces significant challenges related to natural hazards, including increased flooding (46%) drought (35%), cyclones (85%), putting around 85% of the region's people at imminent risk of natural disasters and increased vulnerability of the local populations (The United Nations Migration Agency, 2020). It is pertinent to note that despite the natural potential and diversity for tourism development, events such as cyclones and floods have caused the destruction of human lives, economic activities, and infrastructure (Government of Mozambique, 2017). Mozambique's vulnerability to natural disasters can be analyzed from various perspectives, but it is worth mentioning that three perspectives/dimensions are more important, namely:

1- Physical-geographical dimension

Existence of a long coastline of about 2700 km in the Indian Ocean, where several storms and tropical cyclones are formed every year, imposing risks to 60% of population and infrastructure. Existence of nine international hydrographic basins and about 104 national ones which flow their waters into the Indian Ocean, crossing the flat area of Mozambique in the west-east direction mostly resulting in floods and inundations.

2- Socio-Economic Dimension

Mozambique is an economically poor country, belonging to the group of 10 poorest countries in the world. That's contribute in somehow to poor resilience of social and economic infrastructures (roads, bridges, schools, health facilities, water and energy supply, etc.) in case of occurrence of natural disasters.

3- Capacity dimension in response to natural disasters

The country lacks capacity in terms of quantity and quality of technical staff and public institutions, material and economic means for efficient and effective proactive action in natural disaster management.

2.1.5 Types of natural disasters in Mozambique

Historically, Mozambique has been highly exposed to various natural disasters, and it has been mentioned that out of 156 national districts, 67 are prone to natural disasters (floods, cyclones, droughts, earthquakes, and epidemics), and also Southern African region where Mozambique is located is particularly susceptible to these phenomena, which leads to considering the region as the most affected or vulnerable to weather-related disasters (Salvucci and Santos, 2019). Baez et al. (2018) in turn reports that Mozambique is ranked third among African countries in terms of exposure to multiple weather-related hazards.

1. Storms and cyclones

Constitute the most common natural disaster in the country along 2 770 km of coastline, reaching an average speed of 170 km/h, putting at risk approximately 60% of the national population, destruction of social and economic infrastructure (Disaster Management Coordinating Council (2019). Strong winds, storms, and heavy rainfall from cyclones greatly damage infrastructure, disrupt water and electricity supply systems, and degrade the coastal environment, which is often attractive for developing tourism activities (World Bank, 2011). This is further confirmed by Baez et al., (2018) when they pointed out that the Mozambican coastline is one of the most active basins for tropical cyclone formation in the world. As an example, according to Disaster Management Coordinating Council (2019), in two years, i.e., 2018/2019, 15 tropical systems (depressions and cyclones) were formed in the south-western Indian Ocean basin, three of which with severe impacts reached Mozambique Channel and affected the national coast up to 250 Kilometres inland.

2. Floods

In Mozambique floods generally occur every two to three years, mainly during the rainy session from October to March (Baez et al., 2018). For the Ministry of State Administration and Public Service of Mozambique (2017), floods result from weak water management capacity, and 45% of the country is flat which allows for the expansion of floods with some speed and easiness. This, coupled with the fact that there are 9 regional

hydrographic basins that cross the country and drain their waters into the Indian Ocean, as well as many national waterways with a total of 104 hydrographic basins.

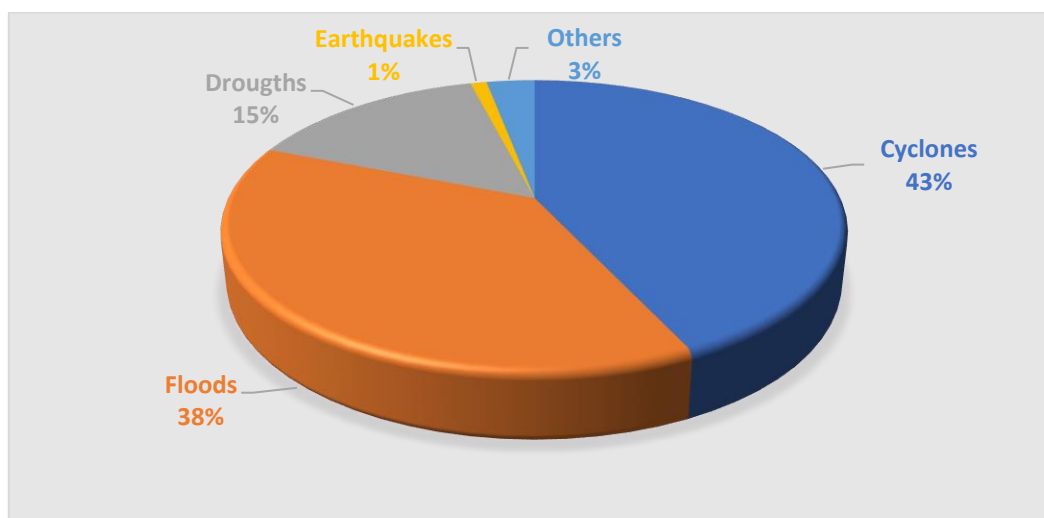
3. Droughts

A large part of Mozambique, especially in the southern and central regions, is located in the arid and semi-arid zone with cyclical and prolonged droughts that affect all sectors of the economy (Ministry of State Administration and Public Service of Mozambique, 2017). This situation is supported by the World Bank (2011), by stating that droughts are one of the most frequent natural disasters in Mozambique, affecting, in particular, the central and southern regions of the country, occurring every three or four years, resulting in about 100 thousand deaths and 17 million people affected, besides representing a major constraint to development (loss of harvests, reduced primary productivity in coastal areas, reduced grazing areas, increased food imports, loss of wildlife, an outbreak of diseases and loss of biodiversity).

4. Earthquake

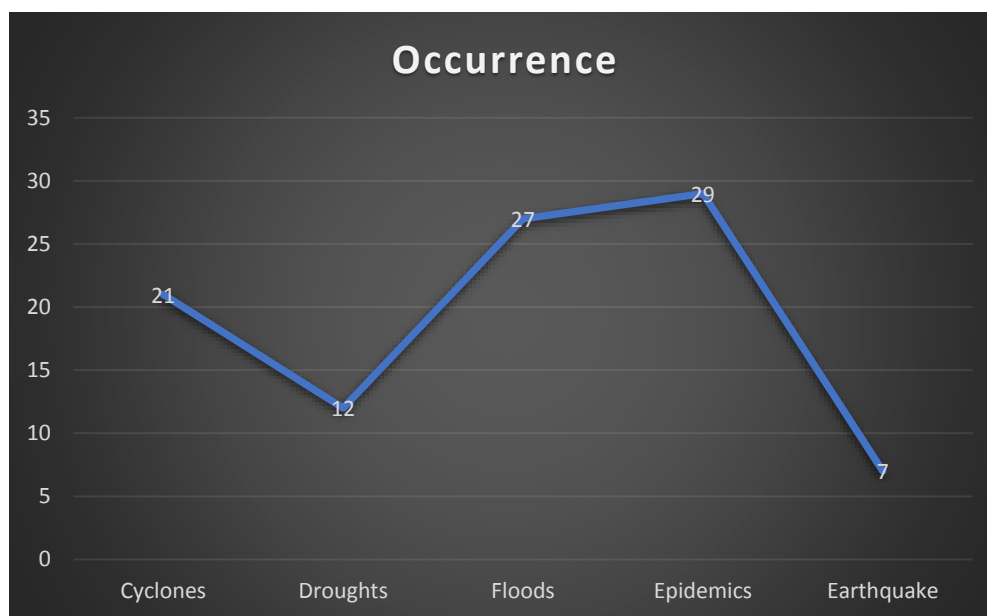
World Bank (2019), states that Mozambique's location at the southern end of the East Rift is a major factor in the country's susceptibility to these phenomena. The seismicity associated with the System extends from the north to central Mozambique. The highest levels of earthquakes occur in the northwestern regions of Niassa and southwestern regions of Manica and Sofala, often causing landslides and disruption of transport networks and essential services due to earth movement displacing roads, railways, bridges, telecommunications, electricity, and other services. The Ministry of State Administration and Public Service of Mozambique (2017), highlights the same region that is crossed by the Rift Valley from the north and center of the country for greater vigilance and the design of territorial plans to minimize damage in the event of natural disasters. Thus, the **figure 1** below summarized the average annual probability of occurrence for each type of natural disaster (World Bank, 2019), based on vulnerability to natural disasters, high levels of poverty, and inadequate infrastructure within the country.

Figure 1. Probability of occurrence on natural disaster in Mozambique per year



Source: World Bank, 2019

Chart 1. Total number of natural disasters by type in Mozambique 2000-2020;



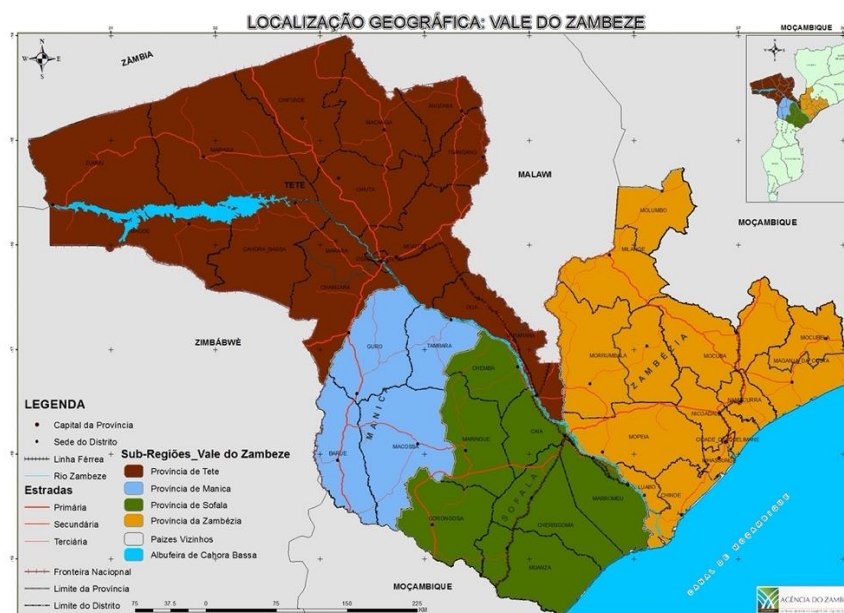
Source: Government of Mozambique, 2017

2.2 ZAMBEZI VALLEY REGION (CASE STUDY)

2.2.1 Physical description of the study region

The Zambezi Valley is located in the central region of Mozambique, between parallels 14°00'S and 19°00'S and between the Greenwich meridians 30°00'E and 37°00'E, making up a total area of approximately 228 000 km² and bordered by three Southern African countries (Malawi, Zambia, and Zimbabwe). The region is integrated into the terminal portion of the international hydrographic basin of the Zambezi River (lower Zambezi), from the border with Zambia and Zimbabwe, covering about 900 km to its mouth in the Indian Ocean. In Mozambique, it comprises 40 districts, of which 15 are in Tete Province, 14 in Zambézia, 7 in Sofala, and 4 in Manica “see Map 1 below” (Zambezi Valley Development Agency, 2019). The Zambezi Valley region has a vast coastal strip of about 400 kilometres. Literature states that if it were a country, would rank 85th in a territory in the world (Zambezi Valley Development Agency, 2018).

Map 1. Geographical location Zambezi Valley Region



Source: Prepared by the author

2.2.2 Potential of the Zambezi Valley region

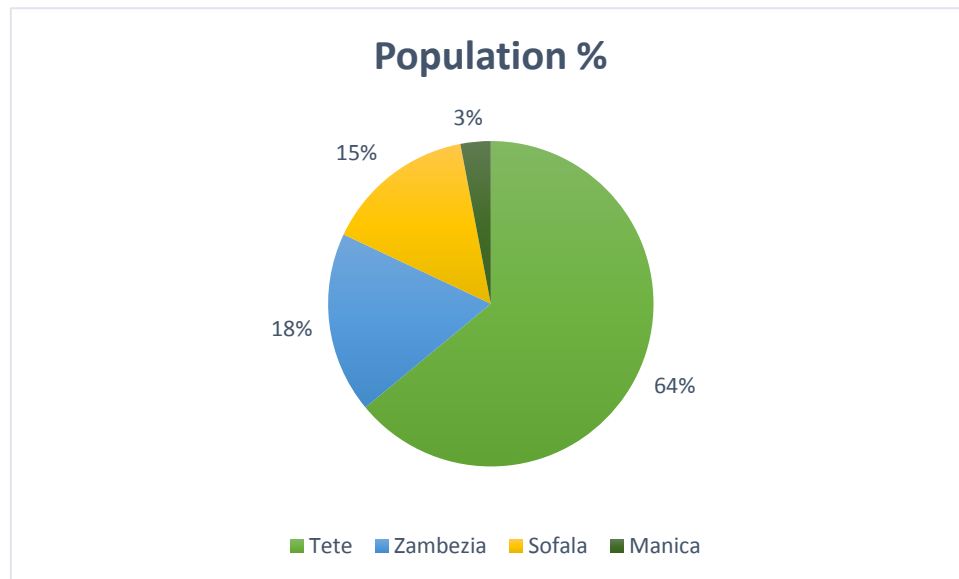
According to the Zambezi Valley Development Agency (2015), the availability of water is the most precious and strategically most important resource in the region, with one of the largest freshwater reserves in the African continent covering an area of 2,660 km² (270 km in length and 30 km in width) with 52 million m³ of freshwater, representing 9.5% of the surface area of Lake Niassa which is the third-largest freshwater reserve on the African continent. It has abundant and diverse natural resources as following:

- Water - 52% of the country's water resources;
- Soils - 220 million hectares:
 - 2.5 million hectares with agricultural potential,
 - 2 million hectares with forestry, pastoral, and forestry potential), fauna, flora, and biodiversity that surpasses any other country and
 - Largest reserve of high-quality coking coal and iron.

2.2.3 Population of the Zambezi Valley

The projections of the National Institute of Statistics 2008-2040 (2018), indicate that the population of the Zambezi Valley region is mostly young, approximately 7,109,843 inhabitants of which 3,248,089 are men and 3,654,602 women, corresponding to 28% of the total population of Mozambique and about 3 million inhabitants are considered economically active. Although, despite its diversified and significant potential in natural resources (water, land, flora, fauna, coal, gas, gold, etc.), the level of human development in the region is low. National Statistics Institute (2015), states that the population of the Zambezi Valley region is mostly poor (54%) according to the poverty index of the Ministry of State Administration and Public Service (2015), youth, women, without professional qualification, and self-employed in subsistence family agricultural production, standing at about 88% and only 12% is engaged in economic activities (trade and services).

Figure 2. Population of Zambezi Valley Region by region 2021



Source: Zambezi Valley Development Agency, 2015

2.2.4 Tourism in the Zambezi Valley Region

Tourism in the Zambezi Valley region is essentially related to the great potential, linked to the conservation areas (national parks, game reserves, and special reserves) that provide competitive and comparative advantages for esotericism and game tourism by attracting safari operators and national and international tourists (Ministry of Land, Environmental and Rural Development (2019). The same author adds that the Cahora Bassa Dam, the fifth in Africa for energy production, is a hot spot for tiger fish fishing with national and international tournaments, and the region is also a spot for various cultural events, especially the Nhau dance, designated a cultural heritage of humanity by UNESCO.

The Zambezi Agency (2018) in its Strategic Plan for the development of the Zambezi Valley Region, points out that the local wealth in terms of biodiversity (as an attractive factor for tourism), is home to about 1,185 species of flora, 73 of which are protected and 1,270 of fauna, concentrated in the Gorongosa National Parks, Magoé, Marromeu National Reserve, 3 Forest Reserves and 10 Game reserves, the existence of a RAMSAR area and 3 Important Birds Areas (IBA's) and community projects for game management.

The excellent natural characteristics of the Zambezi Valley region enable the development of tourism, combined with the fact that its privileged location in relation to the hinterland and the sea attracts potential investors, users, and customers with diverse interests. The Ministry of Land, Environmental and Rural Development (2019), in turn, identify the Zambezi Valley region as one of the 6 priority areas for tourism investment according to the Mozambique Tourism Strategic Plan 2015-2024, mainly for conservation and adventure tourism in the Gorongosa (Sofala) and Chimaimani (Manica) national parks.

The growth of regional economic activity, induced by the establishment of multinational coal, tobacco, forestry, and livestock companies, has created a demand for infrastructure and services related to tourism (accommodation, transport, etc.). In the last 13 years, the development of tourism infrastructures (hotels, restaurants, and associated services) has been visible in various parts of the region, especially in the city of Tete and Moatize to meet the needs of the developments related to the exploitation of natural resources, such as coal (Zambezi Agency, 2018).

The prioritization of tourism in the region, driven by its unique characteristics and potential in the Southern African region (Ministry of Land, Environmental and Rural Development (2017), considered that the Zambezi Valley region would receive an annual average of 25.4% national tourists and 6.6% international tourists during the period from 2015 to 2019. Therefore, according to the Tourism Statistics Yearbook prepared by the National Statistics Institute of Mozambique (2020) this situation did not meet expectations, given the frequency of natural disasters. The tourism sector in the Zambezi Valley region employs some 338,475 people, representing 25% of all tourism jobs in the country. The **Table 7** below presents the number of national and international tourists in the reference period of 2019 to 2019, according to (Mozambique's National Institute of Statistics, 2020).

Table 7: Total number of tourists in Zambezi Valley Region 2015-2019

Year	Number of International tourists	Number of Domestic tourists	Total number of tourists
2015	18373	69373	87746
2016	14231	57631	71862
2017	11164	53467	64631
2018	12931	51603	64534
2019	8958	34394	43352

Source: Mozambique National Institute of Statistics, 2020

In **figure 5** below is evident a decrease in the total number of tourists in the Zambezi Valley region, this is contrary to the projections of the Ministry of Culture and Tourism (2015), which predicted in its optimal scenario growth in national and international tourist arrivals of 35% by 2019.



Figure 3. Total number of international tourist in Zambezi Valley Region 2015-2019



Figure 4. Total of national tourist Zambezi Valley Region 2015-2019

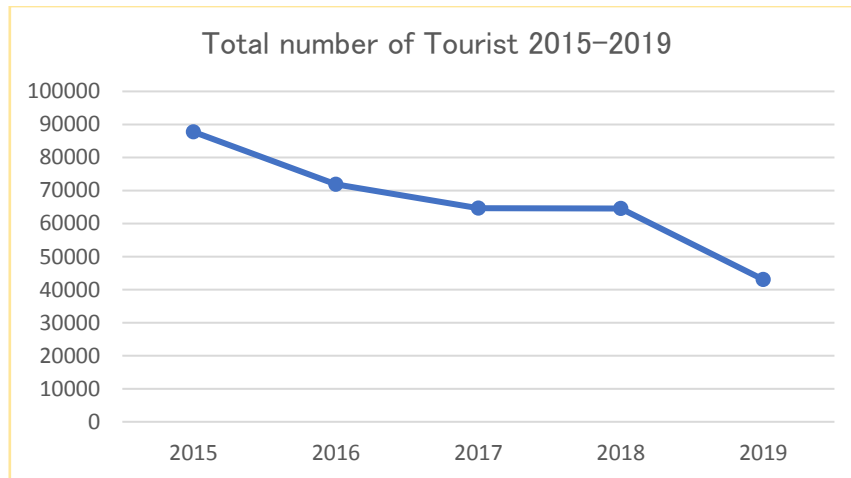


Figure 5. Total number of tourist Zambezi Valley Region 2015-2019

2.2.5 Natural disaster in the Zambezi Valley Region

The Zambezi Valley region presents exposure to major natural threats and significant vulnerability to natural disasters (Zambezi Agency, 2018). The Multisectoral Plan (2017), states that the Zambezi Valley region in Mozambique due to its geographical location is prone to natural disasters and is more vulnerable to the effects of floods and cyclones. Between the months of November and April, the region is often hit by tropical cyclones and tropical depressions which are responsible for exceptionally high daily rainfall volumes, which mainly affect the coastal plains (Ministry of Land, Environmental and Rural Development, 2019). ARA-Zambeze (2020), an entity created by the Government of Mozambique to manage the Zambezi hydrographic basin, states that this basin, like the other hydrographic basins in the country, is vulnerable to the occurrence of extreme events, in particular floods and cyclones that have caused enormous damage to the local community and livelihoods.

The Zambezi River, with a course of 900 km from the border with Zambia to its mouth in the ocean, as well as a coastline of approximately 400 km, places the Zambezi Valley region as one of the most prone and vulnerable to the effects of natural disasters (cyclones and floods) in the world. For instance, in 10 years, 2010 to 2020, the region suffered 6 times major natural disasters (3 cyclones and 3 floods), with severe impacts on

human life, economic activities, and infrastructures. The **table 8** below shows the number of times each phenomenon in the above-referenced period.

Table 8. Total of natural disasters in Zambezi Valley Region 2013-2020

Year	Name of natural disaster	Number of people affected	Number of people killed
2013	Flood	240000	112
2015	Flood	400000	65
2017	Flood	79000	44
2019	Idai Cyclone	1500000	2000
2020	Eloise Tropical Storm	36000	25
2020	Chalene Cyclone	74000	20

Source: Compiled by the author based on Ministry of State Administration and Public Service of Mozambique, 2017

2.3 Theoretical Summary of natural disaster and tourism in Mozambique

Globally, natural disasters pose a significant threat to the development of several developed and developing countries. The frequency and intensity with which these weather phenomena occur have created enormous challenges for people's lives and livelihoods. Approximately 142 billion dollars are spent on natural disasters each year, and this figure has increased significantly over the past few years, according to Lopez et al., (2015), to nearly 185 billion dollars each year.

The tourism industry contributes significantly to the growth of the global economy. As a matter of fact, it constitutes one of the major sources and priorities for most developing countries. However, despite tourism's significance for generating revenue for many countries, it is the sector most affected by natural disasters, for a number of reasons, including the fact that it develops in zones that are susceptible to these phenomena, and due to the disruption of tourism and complementarity services since tourism is heavily dependent on other industries' fluidity. As one of the world's poorest countries, Mozambique is considered the

third most vulnerable to natural disasters (floods, cyclones, droughts, earthquakes, and epidemics) in Africa. It ranked 35th globally and 24th among countries least prepared to withstand the effects. The World Bank (2019) highlights that the country presents 5 of the 6 natural disaster vulnerabilities, making it more vulnerable, as well as a marked socioeconomic porousness resulting from poverty.

Although the country is one of the poorest in the world, its tourism industry is extremely developed. It is nonetheless pertinent to note, that the sector generally experiences adverse phenomena on a cyclical basis. Due to the weakness and constant breakdown of public and private services that galvanize the tourism sector in the Zambezi Valley region, cyclones and floods frequently cripple tourism growth. They disrupt the market connection between tourists emitting and receiving markets. Natural disasters have a notorious impact on the growth of the global economy. Tourism, which is naturally exposed to and dependent on other sectors of activity, appears to suffer the most from these phenomena. Risks and vulnerability in the Zambezi Valley region are aggravated by a weak social and economic structure (exposure of the population and lack of public and private infrastructure).

CHAPTER THREE

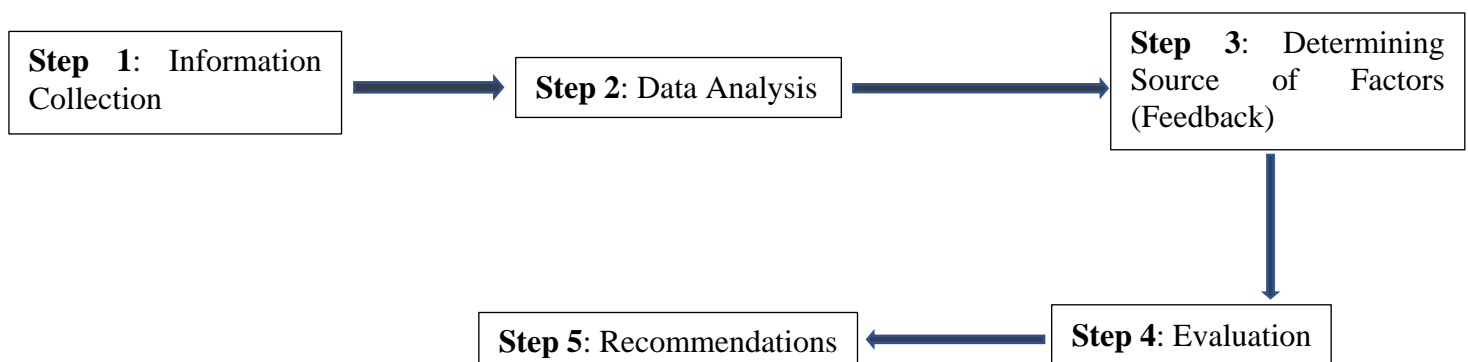
3. Research methods

3.1 Introduction

Research undertaken in this regard is a case study aimed at understanding the extent to which natural disasters are influencing the tourism sector in the Zambezi Valley region. The research methodology consists of an exploratory approach that is based on the use of content analysis in conjunction with narrative analysis. The rationale behind the decision to use qualitative data analysis is the ability to evaluate in depth the individual experiences of the respondents concerning the problem being studied. The chapter is structured into six subcategories: 1. the data collection process; 2. Data from existing literature; 3. the interview process; 4. data analysis; 5. categorization of data; and 6. recommendations.

According to Genç (2018), risk assessment for the natural disaster in tourism is an important process in order to evaluate the possible damage of the risks and take some measures before they cause a massive amount of loss of life and property. In order to find solutions to the issue, academicians as well as policymakers have been focusing on risk analysis of natural disasters, conducted analytically into five main steps.

Figure 6. Natural disaster risk assessment in tourism



Source: Adapted by the author adapted from Genç (2018)

According to Tsai & Chen (2011), the phase one involves gathering basic information by which the complexity of the study can be assessed. A second step involves the analysis of

collected data within a conceptual framework of a methodological scope defined in order to determine the complexity of the problem under study. The next step is to determine the factors that increase the likelihood of negative impacts of natural disasters, taking into account the destination's geographical location. The fourth dimension focuses on evaluating the circumstances that result from the factors of risk, vulnerability, socioeconomics, prevention, relief strategy, and risk management. A fifth stage aims to present and recommend resilient measures and solutions through an evaluative analysis. In order to ensure the tourist destination can effectively withstand the effects of natural disasters, robustness and resistance must be built.

The research follows a qualitative method (exploratory), based on what people (...) says about the issue in the study, and the data usually comes from interviews, documents as reports, newspapers or journals, etc., observations and audio-visual materials, such as audios and videos (Elkatawneh, 2016). Based on Ahmed et al.'s (2019) analysis, qualitative research can be viewed as a process of naturalistic inquiry that emphasizes the contributions of participants to better understand social phenomena. The strength of qualitative research is its ability to provide complex textual descriptions of how people experience a given research issue, helping to interpret and a better understanding of the complex reality of a given situation (problem) and its implication (Family Health International, n.d.).

Accordingly, the current study focusing in qualitative method (case study) to examine the meaning of the selected individual and group. Since the qualitative methodologies are able to provide insights into a phenomenon or to obtain deep data that might be difficult to quantify (Matusin et al., 2020). The advantages of qualitative methods are the use of open-ended questions (culturally and meaningful salient to the participant, unanticipated by the researcher, and rich and exploratory in nature) and probing gives the participants the opportunity to respond in their own words, rather than forcing them to choose from fixed responses (Family Health International, n.d.).

3.2 Data collection

Qualitative research often focuses on a limited number of respondents who have been purposefully selected to participate because it is believed that they have in-depth knowledge of an issue to be studied (Save the Children, n.d.). According to the perception of the problem under investigation, two complementary tools were used in the collection of data, namely, data from existing literature (secondary sources) and semi-structured interviews (primary sources).

3.3 Data from existing literature

In order to address objectives 1 and 2 of the study, a quantitative approach is employed that involves collecting secondary data, namely, data that has already been collected during another investigation process (books, dissertations, magazine articles, scientific articles, newspapers, government and non-governmental organizations reports) at the national, regional, and international levels concerning natural disasters and tourism.

3.4 Interviews

An interview offers the possibility of gaining insight into the interviewee's world and a deeper understanding of the nature or meaning of the interviewee's everyday experience (Palmer and Bolderston, 2006). To answer study objectives 3 and 4, the semi-structured interview technique has been used, according to Gill et al., (2008), consisting of several key questions that help to define the area to be explored and pursue an idea or response in more detail. In this sense, semi-structured interviews can be rich and provide a more in-depth appreciation of a subject matter than a questionnaire (Palmer and Bolderston, 2006).

The focus was based on a limited number of respondents to allow collect complex information and learning about the contextual factors that govern individual experiences, as it's believed according to Save the Children (n.d.), the respondents have experienced first-hand and have particular knowledge or expertise regarding the topic under study. As set out in Nigatu (2009), it begins from general open-ended questions, moving towards greater

precision as more information emerges. Thus, to meet the basic needs of the study, online individual interviews through Zoom, WhatsApp and Skype were conducted with public managers at the regional level (Zambezi Valley region), following the composition: 4 managers of tourism services, 4 managers or regional delegates of the national institute of management of natural disaster, and 2 strategic studies officer of the Zambezi Valley Development Agency, a governmental entity, which has responsibility to promote integrated regional development.

Table 9: List of respondents

Respondents	Name	Current position	Sector/Affiliation
Interviewee 1	Milton Barbosa	Disaster Management Expert	Provincial Delegation of the National Institute for Risk Management and Disaster Reduction of Zambézia
Interviewee 2	Jorge Mulaboa	Head of Tourism Department	Provincial Directorate of Culture and Tourism of Zambézia
Interviewee 3	Abilio Nhampa	Head of Tourism Department	Provincial Directorate of Culture and Tourism of Manica
Interviewee 4	Antonio Chimuane	Head of Tourism Department	Provincial Directorate of Culture and Tourism of Sofala
Interviewee 5	Melo Semende	Community Resilience Coordinator	Provincial Delegation of the National Institute for Risk Management and Disaster Reduction of Sofala
Interviewee 6	Portasio Palito	Disaster Relief and Rehabilitation Officer	Provincial Delegation of the National Institute for Risk Management and Disaster Reduction of Tete
Interviewee 7	Gersone Nunes	Director of Studies Services	Zambezi Valley Development Agency
Interviewee 8	Eduardo Mucavele	Head of Strategic Studies Department	Zambezi Valley Development Agency
Interviewee 9	Fatima Faustino	Head of Tourism Department	Provincial Directorate of Culture and Tourism of Tete
Interviewee 10	Victor Alberto	Head of Disaster Risk Management Department	Provincial Delegation of the National Institute for Risk Management and Disaster Reduction of Manica

Source: Compiled by the author based on research interviews

3.5 Data analysis

Data analysis is the process of reducing a large amount of collected data to make sense of them (Kawulich, 2004). The qualitative approach is inductive in nature, where the data speaks for itself and from itself into themes without the bias of an existing theory (Elkatawneh, 2016). According to Nigatu (2009), qualitative data analysis (QDA) is the range of processes and procedures whereby we move from the qualitative data that have been collected into some form of explanation, understanding, or interpretation of the people and situations under investigation.

To better understand the phenomenon under study, qualitative data analysis technique, known as content analysis and narrative analysis approach were used, since, according to Nigatu (2009), the combination of this approaches of data analysis, brings better benefits in the study and understanding of the phenomena under study. The same author emphasised that content analysis approach as the procedure for the categorization of verbal or behavioural data for the purpose of classification, summarization, and tabulation, analysed on by two-level, (1) descriptive: what is the data and (2) interpretative: what was meant by the data (used in the current study) and narrative analysis approach, based in transcribed experiences, and states that every interviewee, observation has narrative aspect and the research has to sort out and reflect upon them, enhancing and present them in revised shape to the reader, in other words, reformulate information presented by people in a different context and based on their different experiences.

It is important to note that to better capture the problem of natural disasters in tourism, the data analysis is also focusing on the tourism disaster vulnerability framework (TDVF) proposed by Matusin et al., (2019), since this approach allows to have a real situation of the problem under study and then propose possible resilient solutions at the regional level, as the human-environment relationship is a core driver of sustainability science (Kates et al., 2001 and Raven, 2002), while the vulnerability is a central element in the human–environment system and for research in sustainability science (Kasperson & Kasperson, 2001). The vulnerability analysis helped to build understanding of the human–environment relationship with the objective to meet the society’s requirements while sustaining various life support

systems (Turner et al. 2003), as tourism also has no exception to bear this human-environment interaction in their system.

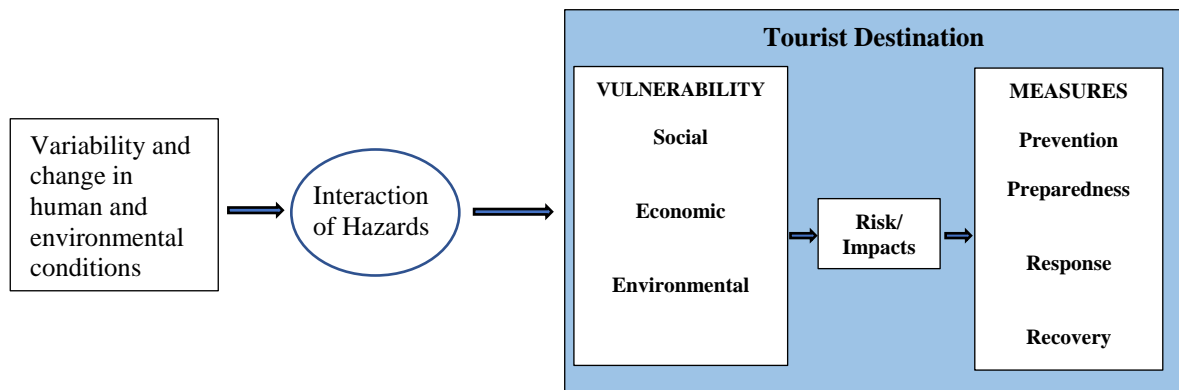


Figure 7. Tourism disaster vulnerability framework

Source: Compiled by the author, adapted from Matusin et al. 2019

3.5.1 Data Categorization

The data analysis process (coding) has traditionally been carried out manually. As long as Adu (2019), suggests that if the excerpts resulting from the interviews are less than 15 pages in length, manual coding should be used to capture the central information presented by the interviewees. According to this author, coding means create and assign labels to represent data excerpts, without losing the meaning beneath the labels.

The coding strategy followed was descriptive-focused coding, which, according to Adu (2019), aims to inform by identifying and describing the relevant data contained in the collected data, focusing on only what the audience described without judgments, interpretations, etc. The choice of the coding method is based on a decision of two comprised steps. Firstly, the analysis determines if the data of the phenomenon studied are in agreement with those intended for the study and, second, whether the information presented may be interpreted beyond the observation.

Afterward, the strategy for categorizing the code is considered. The Individual-based sorting strategy was used in this case, which follows the following steps: Firstly, the codes

were compiled (grouping them according to relevance); then the alphabetical codes were organized for similar excerpts; a third step involved consolidating the codes, which involved assigning the number of times each coded excerpt appears in the text; the fourth step involved sorting codes, which efficiently grouped similar items into clusters based on the problem; and the fifth step involved labeling clusters to identify themes that would guide the findings analysis.

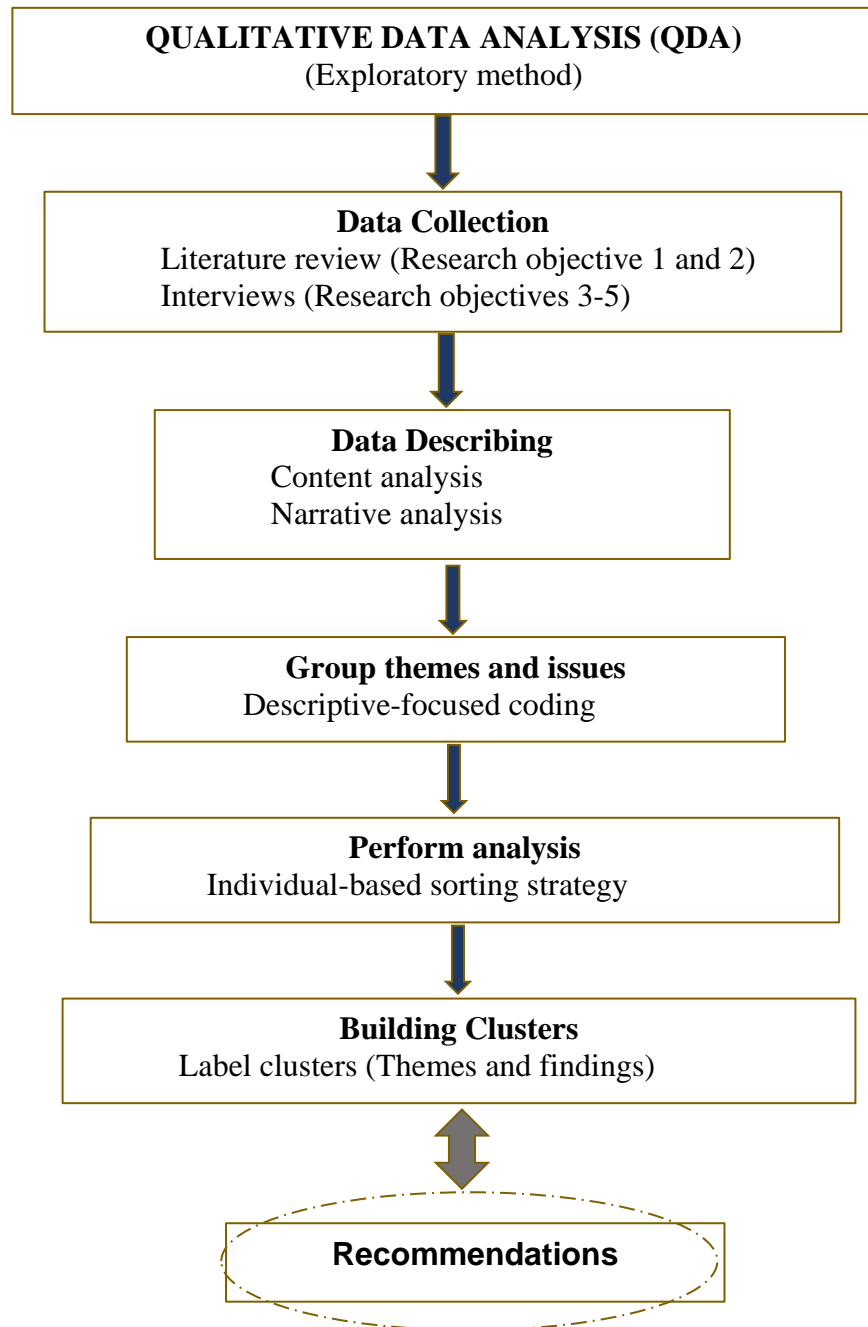
3.6 Recommendations

These recommendations are based on two approaches: first, according to The Resilient Tourism Framework, World Bank's (2020) guide for states, firms, and industry associations on how to incorporate resilience into tourism development by proposing adaptation and mitigation measures for tourism to minimize natural disaster impacts, as well as the three environmental dimensions of the livelihood perspective, as described by Shakya (2009), namely vulnerability, resilience, and sustainability of natural resources.

Resilient Tourism Framework

The approach begins by identifying the natural disaster risks threatening the tourism industry and analysing their potential impacts on destinations and businesses; secondly, planning and prioritizing based on tourism development and investments to build resilience and to minimize the negative impacts of natural disasters on the destination and enterprise; third, the approach pertains to mitigation and preparedness, which is fundamentally focused on promoting and implementing natural disaster-resistant tourism assets and infrastructure, including nature-based solutions to mitigate shocks and assist destinations; the fourth task is to develop response & recovery models that focus on protecting and recovering tourism assets, jobs and businesses through effective design of stimulus and financial packages that enhance competitiveness and the fifth task is to prepare the sector for the sustainability of tourism through natural disaster mitigation (World Bank, 2020).

Figure 8: Data analysis methodology outline



Source: Prepared by the author

CHAPTER FOUR

4. Findings

4.1 Introduction

The Zambezi Valley region in Mozambique has been plagued with natural disasters of various types and severity in the past few years. This include cyclones, and floods. These disasters have affected numerous economic sectors, including tourism which is heavily reliant on its image in order to maintain popularity. Due to this, a drastic reduction in tourism numbers between 2015 and 2019 was verified, coupled with the fact that the Zambezi Valley region has an extremely strong tourism potential, it has been challenged by many natural disasters, as well demonstrating little diversified and dynamic growth through the establishment and expansion of services that comply with international tourism standards, a drastic decrease in tourist was precipitated.

Taking into account the will and inspiration of several authors concerned with establishing sustainable tourism in natural disaster-prone regions, this research aims to determine the extent to which natural disasters affect tourism in the Zambezi Valley region, in terms of economy, destination, and regional integration. If it's fairly to consider that in many parts of the world, natural disasters are considered the cause of the setback of efforts toward sustainable economic and social development, and tourism is viewed as a binding force that, if properly managed, serves as a catalyst for the development of other sectors of the economy. Based on the analysis of data, the findings chapter is structured into four categories: 1. Natural conditions (geographic location and frequency of natural disasters in the Zambezi Valley region); 2. The structure of society (infrastructure and volatility of tourism support services); 3. Institutional cooperation and natural disaster response in tourism; and 4. Sharing and disseminating of information about natural disasters.

4.2 Geographic location and frequency of natural disasters in the Zambezi Valley region

Despite its varied geography, Mozambique is prone to natural disasters, including floods, cyclones, tropical depressions, strong winds, and droughts. Although these conditions occur in different ways in each of the country's three regions. The south region of the country is mostly affected by cyclical droughts, and the central and northern regions are more prone to floods, cyclones, tropical depressions, windstorms, and other severe weather events.

Mozambique's long coastline on the Indian Ocean makes most of natural disasters (floods and cyclones) to be common throughout the whole nation, especially in the Zambezi Valley region in the central part of the country. Thus, the Zambezi Valley disasters are both more frequent and more severe because of the region geographical location in the intertropical zone of the Mozambique Channel in the Indian Ocean, an area where tropical cyclones are common, and the presence of the Zambezi River and its tributaries. A river that runs along a route of 2,574 kilometres through seven countries in Southern Africa. It travels west to east, traverses the coast and flows into the Indian Ocean via the Chinde estuary, and is recurrently influenced by weather conditions from upstream countries, causing extensive flooding downstream.

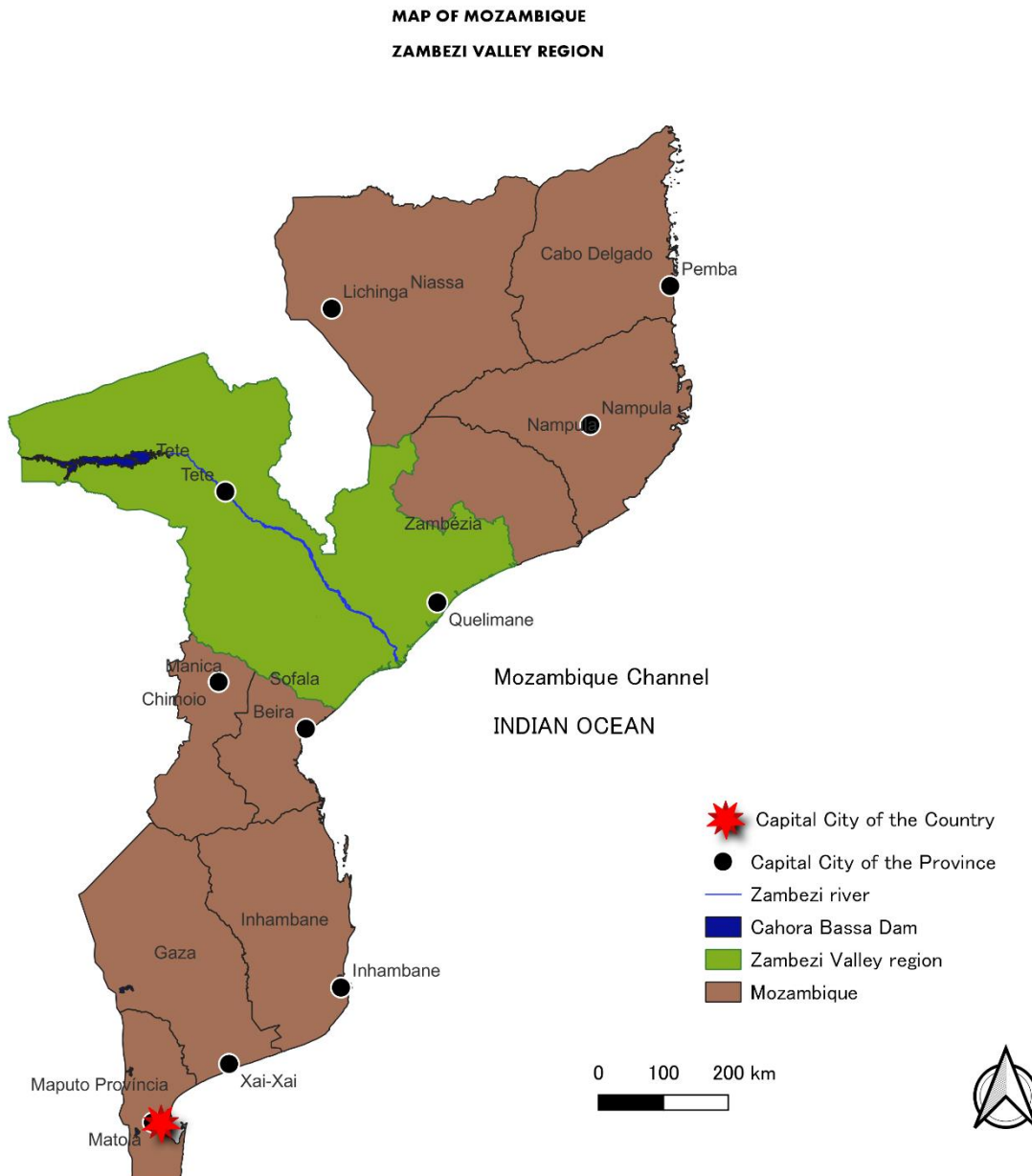
It is noteworthy that this area of the world has a dual influence: on the one hand, there is the intertropical convergence centre that influences the formation of cyclones, storms, and winds, and on the other hand, water flows upstream and downstream of the Zambezi River. As mentioned in summary, by Interviewee 2, 6, 8 and 9; there are sudden rains and tropical depressions during the high tourist season, resulting in cyclones and severe floods. Please refer to the individual excerpts below for a more details **Interviewee 2:** *“Because of infrastructure destruction by cyclones and floods, certain tourist segments have given up visiting the Zambezi Valley due to lack of access to tourist attractions”*; **Interviewee 6:** *“Most of the cyclones in the region are of category 3 and 4, which impacts tourists' choice of destination”*; **Interviewee 8:** *“Floods and cyclones are cyclical in the peak tourist season”* and **Interviewee 9:** *“Floods and cyclones significantly affect the flow of tourists in the region due to destruction of infrastructure”*.

Despite the tourism potential of the region, its location and probability of cyclones and floods constitute a major hindrance to the full development of the sector and support services, since *"tourism is an activity that depends on the complementarity with other areas of activity to be successful"* as mentioned by **Interviewee 1**. Because of the frequency of natural disasters, these services collapse, and tourism in all of its forms is severely impacted. Floods and cyclones strongly influenced by the location of the Zambezi Valley with an average of two disasters per year pose an adverse threat to tourism, social, economic development, and landscape protection. As reported during the Interviewee 1, 2, 3, 5, 7 and 10: the most commonly, the region experiences floods or cyclones affecting most of tourism spots in the area. As the individual excerpts are presented below, **Interviewee 1**: *"In the event of adverse cyclones and floods, tourism is disturbed, which lowers trade"*; **Interviewee 2**: *"Floods and cyclones block tourists' routes and access to tourist attractions"*; **Interviewee 3**: *"The region is severely affected by cyclones and floods, with an average of 2 to 3 natural disasters per year"*; **Interviewee 5**: *"The tourism industry has been severely affected by cyclones and floods"*; **Interviewee 7**: *"The region is severely affected by floods and cyclones"* and **Interviewee 10**: *"As a result of the morphology of the Zambezi Valley region, we often experience cyclones and floods"*.

The floods and cyclones largely destroy all of the infrastructure necessary to sustain tourism in the region (e.g., tourism assets, roads, bridges, telecommunications, and electricity). Interviewee 1, 3, 4, 6, 7, 8 and 9 mentioned that Natural disasters can have an adverse effect on all aspects of tourism, this can prevent access to tourist attractions that are already underfunded, and result in some tourist segments giving up their travel to the affected destinations. Based on respondents' quotes, **Interviewee 1**: *"The occurrence of cyclones and floods affects all tourism-related activities"*; **Interviewee 3**: *"The tourism sector depends on complementarities with other sectors, and disasters pose a huge threat to it"*; **Interviewee 4**: *"Floods and cyclones damage the pleasant environment and infrastructure that support tourism"*; **Interviewee 6**: *"In the Zambezi Valley region, cyclones and floods occur more frequently and are more severe due to its geographic location"*; **Interviewee 7**: *"The tourism sector is severely affected by cyclones and floods, delaying its recovery in the short and*

medium term”; **Interviewee 8**: “Tourism development in general is limited by poor infrastructure, exacerbated by natural disasters” and **Interviewee 9**: “The region is prone to cyclones and floods due to its geomorphological conditions”.

Map 2: Area of study within the country



Source: Prepared by the author

4.3 Infrastructure and volatility of tourism support services

Tourism depends on the complementarity of other areas of activity to perform effectively. Due to the frequency of natural disasters in the region, these services collapse, and the tourism industry suffers accordingly. On the global stage, infrastructure plays an influential role in supporting and facilitating tourism development. The Zambezi Valley infrastructure has been devastated by natural disasters, and as a result, tourism ceases to be an attractive activity for operators. The lack of security services and infrastructure in this region also deters tourists from visiting the area. Consequently, other destinations in the country or region of Southern Africa that offer security and a more diversified range of tourist services, emerge as a priority choice for tourists over the Zambezi Valley, although in comparison, the latter region has a diversified tourist potential.

In order to rehabilitate the tourism infrastructure (hotels, restaurants, lodges, etc.), as well as the tourism support infrastructure (roads, bridges, communications, electricity, etc.), and the environmental and landscape fabric, local operators and the government must mobilize additional resources. The situation severely restricts tourism, as many operators choose to leave the region or the countries to others more secure, thereby, jeopardizing the sector's sustainability locally. There are two ways that the Zambezi region suffers from cyclones and floods: the first is due to physical damage, and structural destruction caused by natural disasters, and the second is due to tourism agents spending significant sums of money on reconstruction when, instead, these funds could have been used to expand services to attract more tourists. In other hand, to preserve the natural environment, most tourism infrastructures are constructed with locally available materials, such as sticks and grass. As a result of natural disasters, these infrastructures are partial or totally destroyed, as set out in Interviewee 1, 3, 8 and 10, it's requires large sums of money from the operators to repair or rebuild them. The situation lead to many of operators to abandon the tourism sector or invest in another sector or safer region or country. Following are excerpts from each interviewee's responses, **Interviewee 1:** *"Floods and cyclones cause total and/or partial destruction of tourist infrastructures since they are constructed from local materials"*; **Interviewee 3:** *"Natural disasters prevent tourism services from expanding in the region"*; **Interviewee 8:** *"Investment in resilient tourism infrastructure poses challenges in the region"* and

Interviewee 10: *“The effects of cyclones are felt everywhere, resulting in total destruction as well as a partial destruction of tourism support facilities”.*

Due to the morphological characteristics of the Zambezi Valley (wetlands), natural disasters greatly affect the connectivity between tourist markets, and transitivity during these times is virtually non-existent in these regions. Despite the existence of secondary and tertiary roads that connect the tourist consumption points, the main roads are in poor condition, and traffic flows in a slow way, contrary to the wishes of tourists whom desire fast and efficient services in order to reach their favourite locations, as all Interviewees stated: The lack of access roads poses a significant threat to tourism since tourists cannot get to tourist areas, and road repair takes time, preventing the region from being the destination of choice at regional (SADC) and international levels. The following is a summary of excerpts from individual interviews, **Interviewee 1:** *“Floods negatively affect the roads due to the characteristics of the region (swamps and humidity)”*; **Interviewee 2:** *“Roads providing access to tourist sites become impassable during natural disasters”*; **Interviewee 3:** *“There is a lack of connectivity between issuing markets and tourist sites because of the destruction of roads and bridges”*; **Interviewee 4:** *“The tourist link roads are dangerous and precarious”*; **Interviewee 5:** *“It's impossible to get to tourist attractions since the roads are totally blocked”*; **Interviewee 6:** *“Access to tourist areas is difficult because of the impassability of roads”*; **Interviewee 7:** *“The roads have become impassable and in some cases destroyed”*; **Interviewee 8:** *“The secondary and tertiary roads connecting tourist areas are impassable during natural disasters”*; **Interviewee 9:** *“Cyclones and floods make many tourist access roads impassable”*; **Interviewee 10:** *“Repairing and rehabilitating tourism access roads takes a long time after partial destruction occurs”.*

Cyclones and floods regularly disrupt all modes of transportation (air, sea, and road) in the same way, impairing the flow of traffic for people from all walks of life and compromising the Zambezi Valley region's tourism economy in particular. Tourism is primarily a private sector business, and frequent natural disasters cause services to close. In the Zambezi Valley region is common for operators to abandon the tourism sector due to its nature of exposure and unpredictability and turn to other industries that are less vulnerable

to natural disasters. Due to the weakness of these services by nature, natural disasters disrupt the supply of goods and services in the region. The number of tourists in the Zambezi Valley has significantly declined due to the severity and frequency of cyclones and floods. The consequence has been a decline in tourism revenue in the Zambezi Valley region since the peak tourist season overlaps with the summer season when natural disasters (cyclones, floods) are more likely to occur, as confirmed by Interviewees 1, 4, 5, 7 and 8, the number of tourists in the region has drastically declined due to natural disasters. In accordance with the individual statement, **Interviewee 1**: “*Natural disasters have led to a total decrease in tourists*”; **Interviewee 4**: “*The region is experiencing a decline in visitors*”; **Interviewee 5**: “*The number of tourists visiting the Zambezi Valley has decreased*” and **Interviewee 8**: “*Natural disasters lead to a reduction in tourists*”.

4.4 Institutional cooperation and natural disaster response in tourism

The impact of natural disasters can be lessened by the efforts of institutions working together. A critical function of this tool is to create operational robustness in countries and regions, especially those with limited technical and financial capability. By bringing together the public and private sectors with non-governmental organizations, one can create conditions in which economic sectors can resist, or in cases of being affected, have the capacity to rebuild themselves within the time and space considered acceptable for economic growth.

This lack of institutional cooperation has led to a lack of collective actions in response to natural disasters in the tourism sector in the Zambezi Valley region. This is because the Local Disaster Management Councils do not consider tourism sector as priority industry. This is because tourism is a sector that is typically marginal to be included in the discussion, under the pretext that tourism is a 'thing' for the rich. Furthermore, the National Disaster Reduction Plans do not provide any specific information about the tourism sector in the Zambezi Valley. Moreover, sectoral coordination focuses primarily on safeguarding human lives without leaving much room for discussion of issues such as tourism in all its aspects. Interviewee 2, 4, 7 and 9 reported it is noteworthy that the National Institute of

Disaster Risk Management, does not take specific measures to address the impact of natural disasters on the tourism sector. As reported by each interviewee individually, **Interviewee 2:** *“The tourism sector is not represented in the vertical structure of the Emergency Operations Centre”*; **Interviewee 4:** *“Currently, tourism is not coordinated with the Disaster Management Agency, which concentrates on safeguarding lives”*; **Interviewee 7:** *“Compared to other sectors, tourism receives little attention from disaster management”* and **Interviewee 9:** *“Tourism has low priority on the Disaster Management Agency's agenda”*.

Due to this non-visible nature, there are no specific measures taken unilaterally by the tourism sector to reduce the impacts of natural disasters at the local level, but rather to focus on sensitizing tourism operators on resilience measures to reduce damage from natural disasters. It's consensual for all interviewees that plans are drawn up at the central level without much input from the tourism sector in the Zambezi Valley. These are the results reported by individual interviewees, as follows **Interviewee 1:** *“No specific tourism plan is in place, since tourism does not directly contribute to people's safety”*; **Interviewee 2:** *“The sector has followed the National Plan for Natural Disaster Prevention and Response”*; **Interviewee 3:** *“According to the national-centered plan, all sectors in disaster-prone areas will be transferred, but the tour operator bears the burden of transfer”*; **Interviewee 4:** *“The tourism sector's organization and investments are not adequate to meet all stakeholder interests and cope with challenges”*; **Interviewee 5:** *“Central planning is responsible for developing local tourism plans”*; **Interviewee 6:** *“At the national level, the National Disaster Institute is responsible for preparing emergency plans”*; **Interviewee 7:** *“The Zambezi Agency has plans to support the tourism industry, but they have not yet been implemented”*; **Interviewee 8:** *“Plans and strategies are developed centrally and implemented locally”*; **Interviewee 9:** *“A central level plan is presented to the regions for enactment”* and **Interviewee 10:** *“Local levels have very limited influence on regional contingency plans”*.

One of the bottlenecks related to the frequency and intensity of natural disasters with devastating effects in the region is the difficulty in securing funds for the operationalization of disasters related activities. Centrally, there are regional quotas, but in practice, these do not flow to the region level. The strategy used is to seek for support from cooperation partners

for the response to natural disasters, and not even the tourism sector does not have a priority for receiving funds, as posed by interviewee 1, 3, 5, 6 and 8, the lack of sectoral coordination attributed to a lack of means and a limited budget. Respondents individually stated; **Interviewee 1:** *“A quota has been set in the national contingency plan to meet sectoral needs centrally, but has no impact on regional needs”*; **Interviewee 3:** *“Government officials mentioned there is a fund to assist tourism operators in case of emergency, but there is no such fund”*; **Interviewee 5:** *“No emergency funds available”*; **Interviewee 6:** *“There is no funding. In emergency situations, the government seeks assistance from cooperation partners”* and **Interviewee 8:** *“A lack of funds and the public sector was mobilized for assistance”*.

Across the board, the country lacks Destination Management Organizations and a vibrant private sector. This is because tourism is a sector that is directly reliant on public funds for its implementation and sustainability. Nonetheless, the Zambezi Agency has included some operational actions in its Development Plan as part of its mandate to promote sustainable development in the Zambezi Valley region. These measures include the promotion of tourist routes and packages for the region and the strengthening of tourism infrastructure in order to attract more investment. Although not yet implemented, these plans play a crucial role in the promotion of specific actions aimed at ensuring tourism resilience in the Zambezi Valley region.

4.5 Information sharing and dissemination

The frequency, fluidity, and effectiveness with which natural disaster information is provided in affected areas are crucial to a better response. Likewise, in the Zambezi Valley region, verticality is a key aspect of the development process (top-down). During the course of a natural disaster, a notification is issued at the central level and a notification is followed up by the provincial or regional delegations, which task specialized committees with the proper dissemination. Due to tourism's low visibility in the search for disaster solutions that impact its development, it is largely omitted from natural disaster management committees. The information sharing and dissemination forums are usually held once or twice a year. They involve various segments of society, non-profit organizations, cooperation partners, local leaders and communities, civil society, and so on, however the tourism sector

is poorly represented. Therefore, its motivation to be on the front line in finding solutions to the effects of natural disasters on tourism in the Zambezi Valley region is diminished. In the interviews, it was stated by all interviewees that it won't be possible to make progress against natural disasters in tourism when it is dependent solely on government action. Individual interviewees reported the following; **Interviewee 1:** *"Government and private sector cooperation should be encouraged"*; **Interviewee 2:** *"Decentralizing actions and making tourism responsible should be the key objective of the government"*; **Interviewee 3:** *"Governments and the private sector must work together to find solutions to disasters"*; **Interviewee 4:** *"Currently, the government is responsible for finding disaster relief solutions"*; **Interviewee 5:** *"Establishing regional tourism bodies to ensure the implementation of government initiatives"*; **Interviewee 6:** *"Local tourism associations play a crucial role in the success of tourism"*; **Interviewee 7:** *"Private agents always trail the government when it comes to tourism actions"*; **Interviewee 8:** *"Only the public sector has a responsibility to promote tourism resilience"*; **Interviewee 9:** *"Tourism stakeholders in the Zambezi Valley need to take proactive measures to galvanize the industry"* and **Interviewee 10:** *"The tourism sector needs better protection against natural disasters from government actions"*.

CHAPTER FIVE

5. Discussion

5.1 Introduction

Three perspectives are most relevant to the vulnerability of tourism in the Zambezi Valley to natural disasters. The first dimension is related to the natural conditions of the region, which are as consequence of its geographical location in a high-risk area to natural disasters. Another dimension stems from a society's structure, specifically the "infrastructure" built to sustain and guide economic development, and the third dimension emanates from the integration of various actors segments in the pursuit of a cohesive and well-understood tourism sector among all officials and stakeholders.

5.2 The natural conditions

The regularity and intensity of natural disasters, particularly cyclones and floods, have been a significant concern to public and private managers in the tourism sector in the Zambezi Valley, on one hand, because of the negative impacts that they have on the sector, and on the other hand, because they have prompted research for models and perspectives that can provide guidelines to minimize the negative impacts that result from these natural disasters. As Shepherd et al. (2013) explain, the degree of exposure to natural disasters varies from nation to nation, and disasters are not always the result of natural events, but rather, disasters are the result of natural events that occur under conditions of vulnerability. Socioeconomic poverty and fragile sectorial policies in the Zambezi Valley region compound the vulnerability to natural disasters. Vulnerability represents a measure of the vulnerability of individuals, households, communities, and countries as well as their physical and economic assets. There are 3,719 floods and 2,977 cyclones reported each year worldwide, and both are caused by weather patterns and hydrological processes, respectively (United Nations, 2014).

The United Nations Office for the Coordination of Humanitarian Affairs (2020) recommends that cyclones and floods should not only be regulated based on their power, but

also their location and local governments' abilities to respond, since floods and cyclones occur in many tourist destinations around the world (Mello et al., 2009). As a result of cyclones and floods, Rindrasih et al., (2019), believe that cyclones and floods have a differential impact on tourism destinations based on their geographical location and the performance of the tourism industry. There is no doubt that this is in accordance with what happens in the Zambezi Valley region, with the severity of cyclones and floods derived from the lack of technical, operational, and economic capacity of local governments and tourism sectors in fostering tourism resilience. The severity of the impact is often dependent on the market segment and geographic location of the affected destination. There is a direct relationship between tourism products and the geographical setting defined by the components of its natural environment and its application for territorial purposes, with particular emphasis on the climate which contributes to the distinctiveness of each region (Grimm et al., 2018).

According to the Asian Development Bank (2013), natural disasters have increased significantly in frequency in recent years around the world. This trend is particularly evident with the increase in fatal floods and cyclones that are often attributed to climate change as they are four times more likely to result in damage to people and livelihoods. The World Bank (2020) recognizes that tourism development is disproportionately concentrated in places exposed to natural hazards such as coastlines, islands, river valleys, and mountainous areas, and the consequences, according to Grimm et al., (2018), may vary depending upon geographical space, the demand, the supply, and the agents in tourism operations. It is important to note that tourism presents a paradox: on the one hand, the industry strives to communicate a positive image of safety, stability, and low risk, but on the other hand, many of the business aspects are often vulnerable to natural disasters (Nguyen et al., 2015). There may be an impact that Grimm et al. (2018) address with regards to cyclones and floods and how these events can directly affect tourist demand in a negative way and impinge on their choice of location and duration of their journey, or indirectly impact their perception of the destination as a result following some extreme event, resulting in an adverse perception and a sense of insecurity.

Filimonau and De Coteau (2019), states that depending on its geographic location, a destination may be vulnerable to a particular type of threat and suffer damage to a particular degree, since a disaster may trigger another, creating cascading effects that could result in major damage, as first, disasters destroy tourist infrastructure at destinations, limiting their ability to receive tourists following the event; second, natural disasters change consumer perceptions of destinations as safe or not, thereby affecting the ability to receive tourists upon return generally, these extreme natural phenomena result in a period of reduced interest in a tourist region which, on a long-term basis, may last several months, a year or even more, resulting in financial loss on a local and even a regional level (Rucinska and Lechowicz, 2014). The impact of cyclones and frequent floods on tourist services (hotels, restaurants, transport, travel agencies, etc.) in the Zambezi Valley has a significant influence on tourist choice. Similarly, to all other activities in a particular location, tourism is negatively affected by an event such as a natural disaster (Genç, 2018).

It is well established that floods and cyclones have a strong relationship with geographical location, with touristic areas being more at risk than other regions (United Nations Office of the Coordinator for Humanitarian Affairs, 2020). It is clear that geographic suitability for different types of tourism is one of the major reasons for seasonal changes in global tourism demand, and it's also an important factor for determining operating costs and profitability for competing destinations (United Nations Environment Programme, 2008). Ma et al. (2020) state that as tourists, like everyone else, value tranquillity and peace when visiting destinations, as well as the pleasures and activities offered by these places and this has posed a challenge to the physical and psychological well-being of people in the Zambezi Valley region. According to Ma et al., (2010) "without safety and security, tourism cannot flourish" because if a tourist feels unsafe or threatened while visiting a destination, they may form a negative opinion of the place and may not travel there frequently or recommend it to others (Ma et al., 2010). There is a lot of distrust among tourists about safety in the case of cyclones and evacuation plans, which make the Zambezi Valley hostile to tourists, whom are no longer mainly interested in the pleasant tourist environment but are concerned mostly about their safety. Breiling (2016) noted that for most countries touristic activity is still a major driver of economic growth and development, and it is also a means to

enhance the economic security of the people. In this regard, Ma et al. (2020) believe that floods and hurricanes are major hurdles to tourist destinations, as tourists often want a quiet, safe vacation destination and social environment.

The argument here ties in with what Shepherd et al. (2013) say that catastrophe affects people directly because it destroys material assets and deteriorates means of subsistence. It is true that there is a correlation between the magnitude of impact and the problems in various sectors of the region (society, politics, environment, sanitation, finance, etc.). However, this may have negative implications for their resilience and capacity for appropriate responses, since Breiling (2016) says living in a poor country doubles the risk as in the Zambezi Valley region of Mozambique.

5.3 Society's structure

Undoubtedly, the tourism sector is a key sector that supports society and the environment, but there are a number of challenges in this market (Ivkov et al., 2019). Multifunctionality of infrastructures, spread over a broad geographical area, means disruptions of these services by natural disasters can have negative economic impacts on the affected areas and the country as a whole, impeding the achievement of a region's or country's development goals (United Nations Development Programme, 2011). One catastrophe event can cause tremendous damage to the development process in countries with high disaster risk levels and wreak havoc on any progress made to that point (Bello et al. 2021).

Filimonau and De Coteau (2019) point out that tourism destinations that are impacted by natural disasters, including floods and cyclones, exhibit cascading effects that lead to damage to infrastructure, ports of entry, and communications services (critical infrastructure) that originate in inadequate building structures (vulnerabilities) that can withstand disasters. It limits the ability of the region to receive tourists for a long period of time after a disaster. In addition, consumers' perception of safety in tourist destinations is greatly altered by the impact on transit routes and source markets. Mullan (2018) states that cyclones and floods might cause between 30% and 55% of the infrastructure damage to be sustained by the sector, with adverse effects on the supply and operations of both goods and services. Throughout

the Zambezi Valley, the tourism and public infrastructures that support tourism have shown weaknesses due to insufficient funds, causing partial or complete destruction of these infrastructures in cyclone and flood situations, thus halting the fluidity of various tourism segments. The severity of these effects may be dependent on factors such as the severity of the cyclone or flooding (Filimonau and De Coteau, 2019).

Over the course of emissions and decisions, assets become increasingly vulnerable, approximately 35% to 85% of the damage is a result of disruptions in the distribution of electricity, transportation, communications, and other vital resources rather than from the catastrophe itself. It, therefore, confirms the claim made by the United Nations Development Programme (2011) that infrastructure plays a critical role in the development of nations as in many developing countries, however, infrastructure development is often characterized as being extremely sensitive or weak, as well as highly susceptible to natural disasters that wreak havoc on infrastructure.

By exploring the physical characteristics of natural disasters, namely how destructive they can be and their potential to spread across a territory, we can get a better understanding of their impacts on critical infrastructure (Mijalković and Cvetković, 2013). Having an intensity related to the level of local vulnerability in the Zambezi Valley has direct consequences for tourism interests, as infrastructure is damaged, which will result in negative media attention, and consequently, a reduction in tourism that may last for many years following the disaster (Orchiston, 2012). There are many benefits to tourism, such as its diversity, diversified nature, and high value, as well as its physical infrastructure that allows it to exist and thrive, and in this regard, one of the most critical aspects is the abiotic environment that allows those activities to take place and serves as a source of attraction for the tourism industry (World Bank, 2020).

Since tourism is largely dependent on local infrastructure (such as transportation networks, electrical systems, and water supply systems), interruption of these services will negatively impact the destination's image both in the short and long term (Nguyen et al., 2015). It is essential for hazard-prone tourism infrastructure to meet the needs of stakeholders

by reducing escalating risks (Bello et al., 2021). The growing exposure to natural disasters would not only lead to systemic impacts that would be virtually impossible, but hazard-prone tourism infrastructure would also significantly increase risk (Bello et al., 2021). It is likely that the closure of tourism businesses will have an impact on the supply of inputs used by secondary industries in the affected area, as well as in other regions (Yee-Lee, et al., 2012). Various infrastructures (transport infrastructure, businesses that provide services, accommodations) in a destination that generates tourists' consumption are also at risk in the Zambeze Valley region. As a result, household, community, regional, and national actors suffer related losses, decrease investment confidence, decrease job creation, and lower the country's Gross Domestic Product (Nguyen et al., 2015).

As tourism expenditures fuel broader socioeconomic development, these expenditures provide avenues for infrastructure construction, for investments in secondary industries, and for small businesses to create additional income, as well as additional employment opportunities for the local community (Yee-Lee et al., 2012). Transport, roads, water and electric power supply, ports, telecommunications networks, and so forth all have an imperative role in facilitating basic economic and social activities, and the disruption of these systems as it happens in Zambezi region, lead to substantial economic consequences on the basis of delays and increased costs (Narayanan et al. 2016).

As a consequence of cyclones and floods, the Zambezi Valley has experienced impacts on tourism and infrastructure that Rindrasih et al. (2019) refer to as spill-over effects, situations in which others in the tourism industry benefit from the decreased performance of a sector affected by a disaster. Furthermore, the same author mentioned that disasters should not serve as a hindrance to long-term drivers of tourism growth, but rather should serve as a means to accelerate structural change towards stronger, more resilient, and sustainable tourism development, since, according to the United Nations Environment Programme (2008), guests' willingness to visit or not visit a particular destination is heavily influenced by vulnerability to natural disasters, which can lead to negative ripple effects on local, regional and national economies.

5.4 Institutional Integration

According to Shepherd et al. (2013) assert that disaster risk and adaptive capacity are heavily influenced by social, economic, and political variables, all of which have an impact on disaster risk. As a general rule, tourism is largely driven by the private sector, but it is dependent on public infrastructure and resources such as roads, airports, marinas, and the natural environment to function, in turn prompting collaborative efforts between the public and private sector as well as multiple partner agencies (World Bank, 2020). Findings in the Zambezi Valley region confirm the views of the authors regarding the lack of institutional integration between the public and private sectors to search for solutions to the issue of natural disasters in tourism. However, tourism destinations rarely have a history of integrating and working with regional disaster management organizations to address disaster vulnerability and risks (National Environment Programme, 2008), since, according to Nguyen et al., (2015), the industry is generally ill-prepared for natural disasters, taking a passive or almost fatalistic approach to disaster risks.

Consequently, the author advises that disaster response in the tourism sector is primarily a local issue that should be devolved to local government agencies and their networks, and by those whose job it is to minimize life, livelihood, and property losses in natural disasters is generally indicative of a destination's capability to cooperate with and cope with such events effectively (National Environment Programme, 2008). Although the local government is eager to promote resilient tourism in the Zambezi Valley, lack of funds hinders it, as the private sector (tourism operators) depends heavily on the few resources made available by the local government. In their turn, Nguyen et al. (2015) emphasize that effective management of disaster risk demands collaboration and engagement at all levels (public, private, non-governmental, regional associations of service providers, etc.) in identifying, prioritizing, and sharing information, in other words, strengths in responding to apparent potential risks.

Coordination between institutions and stakeholders plays a significant role in strengthening tourism models and enhancing resilience to natural disasters. Nevertheless, the Asian Development Bank (2013) points out that while some countries have recognized and

prepared for natural disasters and flooding, in their national development policies, other countries, such as Mozambique (Zambezi Valley region), may not treat the prevention of these environmental phenomena with the same urgency as the response, often due to a lack of funding.

The United Nations Environment Programme (2008) shares the same view and argues that tourism authorities should assume responsibility for managing natural disasters (cyclones, floods) in their areas, in close coordination with regional authorities and other networks since in many developing countries with abundant natural resources, tourism is regarded as a strategy for increasing the domestic economy. Nguyen et al., (2015), in addition feels that participation in public processes promotes learning that leads to more coordinated and adaptive individual actions, which in turn lead to the articulation and development of collective needs and understandings that form the basis of collaboration, and thus the development of policies that improve the resilience of destinations to natural disasters (Nguyen et al., 2015).

Estevão and Costa (2020) note that institutional cooperation is essential for driving growth in the tourism sector as participation of all stakeholders can help restore confidence in the industry, particularly following a natural disaster. Based on Filimonau and De Coteau (2019) research, collaboration between stakeholders helps tourism destinations handle both the negative impacts of natural disasters and the negative consequences of negative perceptions from consumers. That's imposes the establishment of tourism associations in the Zambezi Valley as crucial to operationalizing government plans and boosting the local tourism economy. Accordingly, Grimm et al (2018) suggest that actions aimed at tackling floods and cyclone damage should be directed at gaining benefits for the receiving communities, tourists, and tourism businesses, in close collaboration with the various local segments in order to legitimize actions and unite efforts around common goals, since according to Orchiston (2012), floods and cyclones are both accompanied by a cascade effect, triggered by an extreme event that is further aggravated by inadequate planning and ill-informed actions on the part of individuals and organizations.

Specifically, Widodo and Hastuti (2019) speculate that the transfer and exchange of information about natural disasters can boost the abilities of public and private managers as well as the physical and material preparedness of tourism destinations. On the other hand, Nguyen et al. (2015) urge cooperation and information sharing among tourism stakeholders to get results in disaster mitigation, and developed a working solution based upon the data obtained from discussions. Although tourism agencies, local service agencies and disaster management tend to work together and integrate in order to address the vulnerability and impacts of natural disasters, it remains a challenging task to build a tourism industry that is resilient to such events, as well as a solid reputation for managing them (The United Nations Environment Programme, 2008).

CHAPTER SIX

6. Conclusion, recommendations and limitations

6.1 Conclusion

Like many countries throughout the world, Mozambique is highly vulnerable to extreme weather events. With an average of 1.7 natural events each year, with an estimated value of approximately US\$150 million, it occupies the third position among African countries in terms of exposure to natural disasters. In the aggregate, this is equivalent to 1.06% of the country's Gross Domestic Product. The most significant natural disasters experienced in the country are cyclones, floods, earthquakes, and droughts. These disasters pose significant threats to collective development efforts to achieve social, economic, and environmental sustainability. Though these phenomena display distinctly different characteristics (seasonality and severity) in the southern, central, and northern regions of the country, they have all detrimental effects on tourism. Since the tourism is by its nature interdependent upon other sectors, whose fluidity and complementarity are essential.

In Mozambique's Central region (Zambezi Valley), frequent, intense, and rigorous floods and cyclones constitute a major concern for the tourism sector, resulting on the one hand from the region's location and on the other hand from the vulnerability of local assets to such phenomena. The first is influenced by the convergence center of the intertropical zone in the Mozambique channel, which by nature is the optimum location for the formation of cyclones of high regional severity; and second is the Zambezi River, which drains vast quantities of water from upstream countries, causing floods across large areas downstream, compounded by the fragility of the region landscape. It is important to remember that the smooth flow of tourism lies with the availability of certain infrastructure, and in the Zambezi Valley, flooding and cyclones lead to the destruction of the public and private infrastructure, resulting in the loss of business for tourism operators, the reduction of tourists and the decrease in government revenue from taxes, entrance fees, and other tourism-related economic benefits.

There exists a potential for natural disasters to strike any country or region, although

the differences between them result from how each nation and region address to disasters (United Nations Office for the Coordination of Humanitarian Affairs, 2020 and Mello et al., 2009). Globally, this is a critical threat to tourism that requires coordinated action from all stakeholders (policy makers, tourism operators, media, and local communities) so that all parties can examine the discourse, discussion and expression of collective desires that seek solutions to vulnerability and environmental exposure, as well as incorporate resilient models into tourism. For the Zambezi Valley region, spontaneous, ad hoc and individualized efforts led by both public and private actors create challenges to establishing a convergent consensus. Building consensus among stakeholders is the path that will enable the development of an innovative tourism sector adapted and resilient to increasingly frequent and intense natural disasters.

Given their nature and interdependence, institutionalized cooperation and information sharing on natural disasters in the tourism sector is essential. Nguyen et al. (2015) and Rindrasih et al. (2019) conclude that the lack of appropriate collective measures that address the limitations of time, economic support, and political incentives makes effective collaboration between public and private entities more difficult. The devastating effects of natural disasters should not be overlooked; beyond the destructive aspect, natural disasters can be used as opportunities to reform structural policy in the tourism sector (Rindrasih et al., 2019); however, these reforms in the Zambezi Valley region should be comprehensive, collaborative, and inclusive in order to successfully confront the challenges raised by these extreme events.

Obviously, cyclones and floods are difficult to combat, however, they can be controlled in order to reduce the effects of destruction occurring (Ritchie and Campiranon, 2015; Widodo and Hastuti, 2019 and Nguyen et al., 2015). Thus, the lack of intra and inter-institutional cooperation in tourism in the Zambezi Valley region, gives rise to what Rindrasih et al., (2009), describe as a spillover effect, in which tourism operators and service providers because of the negative reputation of a region due to its vulnerability to natural disasters, lose revenues due to natural disasters, they seek to protect their investments, businesses, etc., by establishing in a less prone region or countries.

6.2 Recommendations

The resilient tourism framework was proposed by the World Bank (2020) to guide governments, tourism firms, initiatives, and associations in integrating resilience actions into tourism sector development plans to improve the tourism destination's competitiveness through innovation, investment, lowering costs, and protecting the destination's reputation. As defined by Development Cooperation (2017), resilience is the ability of systems (in tourism) to respond to, cope with, adapt to, and survive changes over time without changing their fundamental structure and function. Moreover, vulnerability, risk, hazard, stress, and resilience factors are very helpful in identifying the necessary interventions to enable a system to maintain its essential functions. These interventions incorporate mechanisms to detect potential disturbances and accommodate them, thus strengthening the structures and allowing faster successful regeneration.

Hence, this section of recommendations for the Zambezi Valley tourism sector is a consideration to some extent of what Development Cooperation (2017) defines as adaptive resilience, which refers to the ability of the tourism entity or destination to cope with crisis, since the World Bank (2020) says stakeholders in government and in the tourism, industry must take ownership of resilience through a collaborative approach aimed at sharing market opportunities and boosting consumer confidence. It is therefore essential for the Zambezi Valley region to build on the concepts as outlined by Nguyen et al. (2015), strengthening resilience through four types of capital: social (development of trust between all stakeholders); Economic (the pool of resources available, the greater the ability of the area to recover from these adverse events); the physical capital (tourism infrastructure and support infrastructures) and human capital (active education, knowledge and information exchange).

6.2.1 Preparedness and mitigation

6.2.1.1 Understanding the risk of natural disasters in tourism

- Identification and quantitative analysis of exposure, risk, vulnerability and mapping of areas potentially affected by natural disasters (cyclones and floods) within the Zambezi Valley region.

- Incorporating tourism sector risks, exposures, and vulnerabilities into national and regional disaster management plans.
- The tourism sector should be able to participate in the regional disaster management committee so that they can jointly seek solutions to the effects of cyclones and floods on tourism in the Zambezi Valley region.

6.2.1.2 Planning and Prioritizing

- Create an institutional collaborative or cooperative relationship between the public and private sectors, tourism agencies, emergency response agencies, and other stakeholders in tourism. This will enable us to provide common and lasting solutions.
- Forming and equipping regional tourism associations in order to take a leading role in organizing forums to retool the tourism sector to handle flooding and cyclones more effectively.
- Provide education and capacity building to public and private stakeholders, local communities and other partners to ensure local participation in tourism resilience practices.
- Establishing emergency plans and identifying evacuation routes and minimizing tourist fatalities in the Zambezi Valley.
- Establishing partnerships with other regions and tourist destinations that face similar challenges for the purpose of sharing lessons learned and management models for disaster-prone tourist destinations.

6.2.1.3 Preparedness and mitigation

- Establish a mechanism for the sharing of information regarding natural disasters in the tourism industry, preferably using a language that is familiar to tourists. In addition, develop interventions to improve tourism resilience throughout the Zambezi Valley.
- The construction of tourism infrastructures and support services must be aligned with resilient models and public infrastructures that ensure tourism fluidity. It takes into account the type, intensity and frequency of natural disasters present in the Zambezi Valley and the geographical location.

6.2.2 RESPONSE

6.2.2.1 Response and Recovery Measures

- The regional government should create and make available post-disaster reconstruction funds to tourism operators, a stimulus that could promote their permanence in providing tourism services in the region.
- Adopt a communication and marketing strategy that highlights the proactive approach of the Zambezi Valley region to responding to natural disasters with specific and targeted actions. By doing so, it can serve as an attractive destination for visitors.
- Promote the use of innovations, cutting-edge technologies and local knowledge for the monitoring and building a resilient tourism infrastructure.

6.2.3 RECOVERY

6.2.3.1 Long-term Resilience

- Encouraging the use of renewable energy in the tourism sector as a means of reducing the negative effects of tourism on the environment, increasing the frequency and severity of natural disasters worldwide and in the Zambezi Valley region in particular.

- Involvement of local communities in all phases of building cyclone and flood resilience in the tourism sector. Since they are essential for protecting physical, cultural, tourism, and environmental heritage, as well as ensuring competitive advantages for Mozambique as a country and in the Zambezi Valley region.

6.3 Limitations

The first limitation is related to travel restrictions imposed by the Covid-19 pandemic that prevented the author from traveling to Mozambique to collect data and direct observations from the field. As a result of this situation, the use of information and communication technologies (e.g., email, WhatsApp, Skype, etc.) was conditioned for scheduling and conducting interviews, causing several difficulties due to the limited internet connectivity in the Zambezi Valley region. In some cases, this resulted in connection delays, interruptions and having to reschedule interviews.

As another interesting point, the qualitative data analysis (QDA) used in this study requires the author to possess both an advanced level of experience in coding and interpreting the data excerpts collected, as well as a sense of creative abstraction and trustworthiness in order to achieve the desired outcome. This means that no matter what effort the author has devoted to conducting the analysis (within the methodological scope), another observer may, by using the same methodology and a different abstraction, eventually achieve a result that is different from what is presented here.

It was also noted that the tourism agents (private sector) in the Zambezi Valley region have not shown much interest in the research in question, as they have not participated in any of the many interviews scheduled and confirmed to provide their insights. Therefore, this has the potential to affect the analysis and interpretation of findings in the study, since only data collected from interviews with public sector officials in the region were considered.

7. References

- Adu, P. (2019). A step-by-step guide to qualitative data coding: Behavioral sciences, education, research methods. Routledge. London, United Kingdom. Retrieved from www.researchgate.net/publication/334360073_A_Step-by-Step_Guide_to_Qualitative_Data_Coding/citation/download
- Ahmed, S., Irfan, S., Gogoi, S. and Srivastava A. (2019). Qualitative v/s Quantitative Research. Journal of evidence-based medicine and healthcare. Era's Lucknow Medical College and Hospital
- Asian Development Bank (2013). The rise of Natural Disasters in Asia and the Pacific. Learning from ADB's Experience. Independent Evaluation. Mandaluyong City, Philippines
- Baez, J., Caruso, G. and Niu, C. (2018). Extreme Weather and Poverty Risk: Evidence from multiple shocks in Mozambique. Poverty and Equity Global Practice. World Bank Group.
- Banholtzer, S.; Kossin, J. and Donner, S. (2014). The impact of climate change on natural disasters. Department of Geography, University of British Columbia, 1984 West Mall, Vancouver, BC V6T 1Z2, Canada
- Beattie, M. A. (1992). The effect of natural disasters on tourism a study of Mount Saint Helens and Yellowstone National Park. Thesis. Faculty of the School of Food, Hotel and Tourism Management. Rochester Institute of Technology.
- Bello, O. D.; Khamis, M.; Osorio, C. and Peralta, L. (2017). Mainstreaming disaster risk management strategies in development instruments: Policy briefs for selected member countries of the Caribbean Development and Cooperation Committee. United Nations, Santiago
- Bello, O., Bustamante, A. and Pizarro P. (2021). Planning for disaster risk reduction within the framework of the 2030 Agenda for sustainable development. *Project Documents* (LC/TS.2020/108). Economic Commission for Latin America and the Caribbean. United Nations. Santiago, Chile
- Breiling, M. (2016). Tourism supply chain and natural disasters: The vulnerability challenge and business continuity models for ASEN countries. Technology, Tourism, Landscape. Inter-faculty Cooperation Centre. Vienna University of Technology. Vienna, Austria.
- Cooperation for Development (2017). Risk and crisis management in tourism sector: Recovery from crisis in the OIC member countries. Standing committee for economic and commercial cooperation of the organization of Islamic cooperation. Coordination Office. Ankara, Turkey

- Council of Ministers of the Republic of Mozambique (2017). Master Plan for Disaster Risk Reduction 2017-2030. Approved at the 36th ordinary session of the Council of Ministers. Maputo, Mozambique
- Centre for Research on the Epidemiology of Disasters (2020). “CRED Crunch 58 - Disaster Year in Review (2019).” Brussels: CRED.
- Da Silva, J. (2019). Tourism in Mozambique: opportunities, challenges and risks. Pedagogic University of Maputo. Maputo, Mozambique
- Da Silva, K. (2004). Importance of tourism for the economic development of the state of Espirito Santo” Monograph presented to the course of economics for obtaining the academic degree. Department of Economics. Federal University of Espirito Santo. Espirito Santo, Brazil. Retrieved from www.observatoriodoturismo.es.gov.br/Media/observatorio/Publicacoes/outros/monografias
- Dayton-Johnson, J. (2006). Natural Disaster and Vulnerability: POLICY BRIEF No. 29. OECD Development Centre.
- Dias, R. & Cassar, M. (2005). Fundamentals of Tourism Marketing. São Paulo: Pearson Prentice Hall
- Disaster Management Coordinating Council (2019). Report of the Rainy and Cyclonic Season (Emergency) 2018/19. Emergency Operating Center. Maputo, Mozambique
- Elkatawneh, H. H. (2016). Comparing Quantitative and Qualitative Approach's. SSRN Electronic Journal. Walden University
- Estevão, C. and Costa, C. (2020). Natural disasters management in tourism destinations: a systematic literature review. European Journal of Tourism Research
- Family Health International (n.d.). Qualitative research methods: A data collector's field guide. Module 1. Quantitative research methods overview
- Filimonau, V. and De Coteau, D. (2019). Tourism resilience in the context of integrated destination and disaster management. Faculty of Management. Bournemouth University. Poole, United Kingdom
- Save the Children (W/D). 6 methods of data collection and analysis: Monitoring, evaluation, accountability, and learning. The Open University
- Gemo, R. (2017). CRITICAL SUCCESS FACTORS OF TOURISM IN MOZAMBIQUE. Lusophone University of Humanities and Technologies. School of Communication, Architecture, Arts and Information Technologies. Lisbon, Portugal

- Genç, R. (2018). Catastrophe of Environment: The impact of natural disasters on the tourism industry. *Journal of Tourism & Adventure*. Turkish German University, Turkey
- Gill, P., Stewart, K., Treasure, E., and Chadwick (2008). Methods of data collection in quantitative research: interviews and focus group. *British Dental Journal*, Volume 204. Nature Publishing Group. UK
- Government of Mozambique (2017). Master plan for disaster risk reduction 2017-2030. Maputo, Mozambique
- Government of Mozambique (2017). Financial Protection against Disasters in Mozambique. Maputo, Mozambique
- Grimm, I., Alcântara, L. and Sampaio, C. (2018). Tourism in the scenario of climate change: impacts, possibilities, and challenges. Cuiabá: Federal University of Mato Grosso (UFMT), Blumenau
- Inter-governmental Panel on Climate Change (2018). Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. In Press. Paris, France.
- International Federation of National Red Cross and Red Crescent Societies (2012). International Disaster Response Laws (IDRL) in Mozambique: An analysis of Mozambique's legal preparedness for the regulation of issues related to international natural disaster response operations. Geneva, Switzerland
- Ivkov, M.; Blešić, I.; Janićević, S.; Kovačić, S.; Miljković, D.; Lukić, T. and Sakulski, D. (2019). Natural Disasters vs Hotel Industry Resilience: An Exploratory Study among Hotel Managers from Europe. University of Novi Sad. Faculty of Sciences, Department of Geography, Tourism and Hotel Management, Trg Dositeja Obradovića. Novi Sad, Serbia
- Kasperson, J.X. and Kasperson, R.E. (2001). SEI Risk and Vulnerability Programme Report 2001-01. Stockholm: Stockholm Environment Institute
- Kates, R.W., Clark, W.C., Corell, R.J., Hall, M., Jaeger, C.C., Lowe, I. and Svedin, U. (2001). Sustainability science. *Science*, 292(5517)
- Letho, X.; Douglas, A. and Park, J. (2008). Mediating the effects of natural disasters on travel intention. *Journal of Travel & Tourism Marketing*.
- Leví, M. (2012). Contributions of Nature Tourism to the Development of Gorongosa National Park. Lisbon: Lusophone University of Humanities and Technologies, Dissertation for a Master's Degree in Tourism

- Lopez, R. E.; Thomas, V. and Troncoso, P. (2015). Climate change and natural disasters: Series of working papers. Department of Economics, University of Chile. Santiago, Chile
- Ma, H.; Chiu, Y.; Tian X.; Zhang, J. and Guo, Q. (2020). Safety or Travel: Which Is More Important? The Impact of Disaster Events on Tourism. School of Management, China University of Mining and Technology. Xuzhou, China
- Machete, R. (2011). Climate and Tourism in the Context of Climate Change. Lisbon: Centre for Geographical Studies of the University of Lisbon
- Matusin, A. M. R. A.; Siwar, C. and Halim, S. A. (2019). Vulnerability framework of tourism to natural disasters. Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia (UTM) and Institute for Environment and Development (LESTARI), Universiti Kebangsaan Malaysia. GEOGRAFIA Online Malaysian Journal of Society and Space 15 issue 4 (137-150) © 2019, e-ISSN 2682-7727. Retrieved from <https://doi.org/10.17576/geo-2019-1504-10>
- Mello, C.; Mckeown, J.; Minninger, S. (2009). (Org.) Disaster Prevention in Tourism Perspectives on Climate Justice. Ecumenical Coalition on Tourism in cooperation with EED Tourism Watch, Germany.
- Melissa C. K.; Phillips, M. C. K.; Cindrich, A. B.; Burrell, J. L.; Ruper, J. L., Will, R. G. and Sheridan, S. C. (2015). The effect of climate change on natural disasters: A College Student Perspective. Department of Geography, Kent State University, 413 McGilvrey Hall, Kent, Ohio
- Mijalković, S. and Cvetković, V. (2013). Vulnerability of critical infrastructure by natural disasters. The Academy of Criminalistics and Police Studies. Belgrade, Serbia.
- Ministry of Land, Environmental and Rural Development (2019). Strategic plan for tourism development in Mozambique. Maputo, Mozambique
- Ministry of Land, Environmental and Rural Development (2019). National Territorial Development Plan: Phase 3: Territorial characterization and national diagnosis. Maputo, Mozambique
- Ministry of State Administration and Public Service of Mozambique (2017). Table of Disaster Risk Reduction Indicators. Maputo, Mozambique
- Ministry of Foreign Affairs of Netherlands (2018). Climate Change Profile of Mozambique. P.O. Box 20061 | 2500 EB Hague | the Netherlands. Retrieved from www.government.nl/foreign-policy-evaluations
- Mishev, P. and Mochurova, M. (2008). Climate change impacts tourism. International conference "GLOBAL ENVIRONMENTAL CHANGE: CHALLENGES TO SCIENCE AND SOCIETY IN SOUTHEASTERN EUROPE". The University of

- National and World Economy, BG-1700 Sofia, Bulgaria. Retrieved from http://global-change.meteo.bg/conference_en.htm
- Mozambique National Statistics Institute (2015). Final report of the family budget survey. Directorate for vital and social studies and demography. Maputo, Mozambique. Retrieved from www.ine.gov.mz
- Mozambique's National Institute of Statistics (2020). Tourism statistics yearbook. Maputo, Mozambique. Retrieved from www.ine.gov.mz
- Mozambique National Institute of Statistics (2020). Statistical Yearbook 2020. Management and quality control. National Accounts and Global Indicators Directorate. Maputo, Mozambique. Retrieved from www.ine.gov.mz
- Mullan, M. (2018). Climate change infrastructure: Policy perspective. Environment Directorate. Buenos Aires, Argentina
- Musavengane, R.; Leonard, L. and Mureyani, S. (2020): Doing tourism in Southern Africa amid the coronavirus pandemic: Navigating political, socio-economic and environmental inequalities, Development Southern Africa, DOI: 10.1080/0376835X.2020.1829459. Retrieved from <https://doi.org/10.1080/0376835X.2020.1829459>
- National Bureau of Statistics (2018). Tourism Statistics 2016-2018. Directorate of Sector and Business Statistics. Av. 24 de Julho, n° 1989, C. Postal 493, Maputo - Mozambique. Retrieved from www.ine.gov.mz
- National Institute for Disaster Management (2012). Responding to climate change in Mozambique: Synthesis report. Fase II. Maputo, Mozambique. Retrieved from www.ingd.gov.mz
- National Emergency Operational Center (2021). Information on impacts from the 2020-2021 rainy and cyclonic season. Maputo, Mozambique. www.ingd.gov.mz
- Nigatu, T. (2009). Qualitative data analysis. African Medical & Research Foundation
- Nguyen, D.; Fumihiko Imamura, F. and Iuchi, K. (2015). Disaster Management in Coastal Tourism Destinations: The Case for Transactive Planning and Social Learning. Department of Civil and Environmental Engineering, Graduate school of Engineering, Tohoku University, Japan
- Narayanan, A.; Willis, H.; Fischbach, J.; Warren, D.; Molina-Perez, E.; Stelzner, C.; Loa, K.; Kendrick, L.; Sorensen, P. and LaTourrette, T. (2016). Characterizing national exposures to infrastructure from natural disasters. RAND Corporation. Santa Monica, California, United States of America.

- Orchiston, C. (2012): Tourism business preparedness, resilience and disaster planning in a region of high seismic risk: the case of the Southern Alps. Alps, New Zealand.
- Palmer, C. and Bolderston, A. (2006). A brief introduction to qualitative research. The Canadian journal of medical radiation technology. University of Toronto
- Peters, M.; and Pikkemaat, B. (2006). Crisis management in Alpine winter sports resorts – the 199-avalanche disaster in Tyrol. Journal of Travel & Tourism Marketing
- PricewaterhouseCoopers (2013). Rebuilding for resilience: Fortifying infrastructure to withstand disaster.
- Raven, P.H. (2002). Science, sustainability, and the human prospect. Science, 297
- Ritchie, B.; Campiranon, K. (2015). Tourism crisis and disaster management in the Asia-Pacific. CABI Series in Tourism Management Research. Boston, United States of America
- Rindrasih, E.; Witte, P.; Spit, T. and Zoomers, A. (2019). Tourism and Disasters: Impact of Disaster Events on Tourism Development in Indonesia 1998-2016 and Structural Approach Policy Responses. Department of Human Geography and Spatial Planning, Faculty of Geosciences, Utrecht University, Utrecht, The Netherlands. Journal of Service Science and Management, 93-115. Retrieved from <http://www.scirp.org/journal/jssm>
- Rossello, J.; Becken, S. and Santana-Gallego, M. (2020). The effects of natural disasters on international tourism: A global analysis. Tourism Management. Retrieved from <http://www.elsevier.com/locate/tourman>
- Rucinska, D. and Lechowicz, M. (2014). Natural hazard and disaster tourism. Miscellanea Geographica – regional studies on development. University of Warsaw, Poland
- Saarinen, J., Becker, F., Manwa, H., and Wilson, D., (2009). Sustainable Tourism in Southern Africa: Local communities and natural resources in transition. Library of Congress Cataloging in Publication Data. Channel View Publications. London, UK
- Salvucci, V. and Santos, R. (2019). Vulnerability to Natural Shocks: Assessing the short-term impact on consumption and poverty of the 2015 flood in Mozambique. United Nations University World Institute for Development Economics Research. Katajanokanlaituri, Helsinki, Finland.
- Shakya, M. (2009). Risk, Vulnerability, and Tourism in Developing Countries: The case of Nepal. Bochum Studies in International Development. Institute of Development Research and Development Policy. RUHR-University Bochum
- Shepherd, A.; Mitchell, T.; Lewis, K.; Lenhardt, A.; Jones, L.; Scott, L. and Muir-Wood, R. (2013). The geography of poverty, disasters and climate extremes in 2030.

- Department for International Development (DFID). UK aid. Blackfriars, London. United Kingdom.
- Simpson, M., C.; Gössling, S.; Scott, D.; Hall, C.; M. and Gladin, E. (2008). Climate change adaptation and mitigation in the tourism sector. Frameworks, tools, and practices. United Nations Environment Programme. The University of Oxford, United Nations World Tourism
- Southern African Development Community (2019). Tourism Programme 2020 – 2030, Gaborone, Botswana
- The World Bank Group (2019). Disaster Risk Profile Mozambique. Africa Disaster Risk Profiles are financed by the EU-funded ACP-EU Africa Disaster Risk Financing Program, managed by the Global Facility for Disaster Reduction and Recovery. The International Bank for Reconstruction and Development the World Bank Group 1818 H Street, NW, Washington, D.C. 20433, USA
- The UN Migration Agency (2020). Mozambique crisis response: Global crisis response platform. Humanitarian and crisis transition activities. Maputo, Mozambique
- Tsai, C. and Chen, C. (2011). The establishment of a rapid natural disaster risk assessment model for the tourism industry. *Tourism Management*,
- Turner, B.L., Kasperson, R.E., Matson, P.A., McCarthy, J.J., Corell, R.W., Christensen, L. and Schiller, A. (2003). A framework for vulnerability analysis in sustainability science. *Proceedings of the National Academy of Sciences of the United States*, 100 (4)
- United Nations Environment Programme (2008). Disaster risk management for coastal tourism destinations responding to climate change. A Practical guide for decision makers. Sustainable Consumption and Production Branch. Paris, France
- United Nations Development Programme (2011). Paving the Way for Climate-Resilient Infrastructure: Guidance for Practitioners and Planners. New York, New York: United Nations Development Programme.
- United Nations Office for Disaster Risk Reduction (2012). Disaster risk and resilience: Thematic think piece. World Meteorological Organization.
- United Nations (2014). Handbook for disaster assessment. Santiago, Chile
- United Nations Migration Agency (2020). Mozambique disaster risk assessment. The central region of Mozambique. Maputo, Mozambique
- United Nations Office for the Coordination of Humanitarian Affairs (2020). Natural Disasters in Latin America and the Caribbean. Balboa, Ancon. Panama

- Widodo, E. and Hastuti (2019). Disaster and Tourism: How Tourism Responds to Disasters in Magelang District. IOP Conference. Series. Earth and Environmental Science. Java, Indonesia
- World Bank (2011). Disaster Risk Assessment in Mozambique: A comprehensive country situation analysis. Global Risk Identification Programme. Geneva, Switzerland.
- World Bank Group (2016). Disaster Resilient Development in Sub-Saharan Africa: Strategic Framework 2016–2020. Global Facility for Disaster Reduction and Recovery (GFDRR)
- World Bank (2019). Disaster Risk Profile Mozambique: Building disaster resilience in Southern Africa. The International Bank for Reconstruction and Development. Washington, D.C, United States
- World Bank. 2020. Resilient Tourism: Competitiveness in the Face of Disasters. Washington, DC: World Bank.
- World Tourism Organization and the United Nations Environment Programme (2008). Climate Change and Tourism – Responding to Global Challenges. World Tourism Organization. Centro Espanol de Derechos Reprograficos. Madrid, Spain. Retrieved from www.cedro.org
- World Travel and Tourism Council (2019). African tourism sector booming – Second fastest growth rate in the world. Retrieved from <https://www.wttc.org/about/media-centre/press-releases/press-releases/2019/African-tourism-sector-booming-second-fastest-growth-rate-in-the-world/>.
- Yee-Lee, C.; Lin-Sea, L. and Kwang-Jing, Y. (2012). Natural and Consequence of Tourism Industry's Susceptibility to Natural Disaster – A Conceptual Framework using Input-Output Model. Universiti Tunku Abdul Rahman – Malaysia
- Zambeze Regional Water Administration (2020). Evaluation report of the rainy season 2019-2020. Tete, Mozambique
- Zambezi Valley Development Agency (2015). Annual achievements. Report presented to the Economic Council of Ministers. Maputo, Mozambique
- Zambezi Valley Development Agency (2018). Banking strategy of the districts of the Zambezi Valley region. Tete, Mozambique
- Zambezi Valley Development Agency (2019). Development Plan of the Zambezi Valley Region. Métier, Consult and Development. Tete, Mozambique.

7.1 Appendices

DATA COLLECTION QUESTIONNAIRE/DATA ANALYSIS					
	Research Objective 1	Questions	Officer name/Organization	Answer Given	Analysis
Section 1	1.1 Identify the types of natural disasters that most affect tourism development in Mozambique	a) In recent times, Mozambique has found itself vulnerable to natural disasters, greatly affecting all sectors of activity as well as threatening human life. In your experience, what are the most frequent natural disasters in Mozambique?	Eduardo Mucavele / Zambezi Agency	Floods, cyclones/storm/depression and droughts	Cyclones, Floods and Droughts
			Gersones Nunes / Zambezi Agency	droughts, floods and tropical depressions and cyclones	
			Jorge Mulaboa / Tourism Manica Province	Cyclones, windstorms and cyclical droughts in certain regions of the country	
			A. Chimuwane&M. Semende / Tourism Sofala	cyclones and floods	
			Abilio Nhampa / Tourism Zambezia	Floods, cyclones and droughts resulting from the influence of climate change	
			Milton Barbosa/ INGD Zambezia	Floods, cyclones and Atmospheric electrical discharges	
			Portacio / INGD Tete		
		b) Considering the natural disasters mentioned above, which of these have the greatest influence on tourism? Why?	Eduardo Mucavele / Zambezi Agency	floods and cyclone/storm/depression	Cyclones and Floods
			Gersones Nunes / Zambezi Agency	floods and cyclone	
			Jorge Mulaboa / Tourism Manica Province	Cyclones and windstorms	
			A. Chimuwane&M. Semende / Tourism Sofala	cyclones	
			Abilio Nhampa / Tourism Zambezia	Cyclones: destruction of tourist infrastructures, fall of power and communications poles, etc. Floods: flooding of tourist areas, impassable roads	
			Milton Barbosa/ INGD Zambezia	Floods and Cyclones	
			Portacio / INGD Tete		
		c) What makes you say categorically that these events have the greatest influence on tourism? Could you elaborate a little more, giving some examples if possible?	Eduardo Mucavele / Zambezi Agency	These events are cyclical, and the peak of tourism in the region coincides with the time of greatest incidence of these disasters (summer - rainy season)	Destruction of all means of supporting tourism in the region (tourism assets, roads, bridges, telecommunications, electricity, agriculture)
			Gersones Nunes / Zambezi Agency	When they occur they affect all means of supporting tourism. Areas managed with international capital are more resilient to natural disasters	
			Jorge Mulaboa / Tourism Manica Province	Its negative impacts on basic social public infrastructure (roads, bridges, schools, hospitals) as well as tourist resorts have been enormous. Given the destruction of these infrastructures, access to tourist attractions has been deficient, which leads certain tourist segments to give up their trips to these places	
			A. Chimuwane&M. Semende / Tourism Sofala	Given its disruption of infrastructure destruction. The cyclones that act in this region have been category 4 and 3, due to their speed and the location of the region near the coast, where most of them are formed	
			Abilio Nhampa / Tourism Zambezia	Destruction of much of the economic infrastructure (telecommunications, electric power, agriculture, etc.), considered the basis for supporting tourism activity	
			Milton Barbosa/ INGD Zambezia	It affects tourism to a great extent as it is done in the coastal area and rivers flood considerable areas in the rainy season, affecting tourism communities, etc....blocking infrastructures, roads and bridges	
			Portacio / INGD Tete		

Section 2					
Section 2	1.2 Describe the most frequent natural disasters impacting on tourism in the Zambezi Valley region	a) The Zambezi Valley is considered the driving region for the promotion of national development because of its unique characteristics, in which the potential for tourism is a unique attraction (beaches, nature tourism, adventure, cultural, etc.). Do you think that tourism in this region is influenced by natural disasters? If yes, which ones in particular?	Eduardo Mucavele / Zambezi Agency	Yes, floods and cyclones	Tourism is an activity that depends on the complementarity of other areas of activity for its best performance. The frequency of natural disasters in the region causes these services to collapse and tourism is very much affected. The most visible natural disasters that affect tourism are floods and cyclones, with an average of two events per year
			Gersones Nunes / Zambezi Agency	Yes severely	
			Jorge Mulaboa / Tourism Manica Province	Not in Manica province	
			A. Chimuanes&M. Semende / Tourism Sofala	Yes. floods and cyclones	
			Abilio Nhampa / Tourism Zambezia	Drastically, the region on average suffers 2 or more natural disasters (floods or cyclones) per year, influencing the existing tourism potential	
		b) Again, drawing on your experience in this field of knowledge, could you describe how these natural disasters have a particular effect on regional tourism?	Milton Barbosa/ INGD Zambezia	Tourism boosts the exchange of goods which decreases with the onset of disasters. Reduced revenue for tourism operators, local communities and government	Tourist infrastructures (hotels, restaurants, guesthouses, etc.) as well as support infrastructures (roads, bridges, communications, electricity, etc.) as well as environmental and landscape fabric, as natural attractions are often totally or partially destroyed, requiring additional efforts for local operators and government to mobilize financial resources. As a result, many tour operators abandon the region, reducing the revenue of the sector
			Portacio / INGD Tete		
			Eduardo Mucavele / Zambezi Agency	The country in general has precarious infrastructures for tourism development (access roads, energy supply, water and telecommunications, among others).	
			Gersones Nunes / Zambezi Agency	When they occur they affect all means of supporting tourism	
			Jorge Mulaboa / Tourism Manica Province	In the rainy season and for fear of this type of natural disaster, no-one ventures to practice tourism in this region of the Zambezi valley, suspecting that the waters of the Zambezi River may flood areas considered to have great tourist potential, which become impassable	
		c) Can the issue of infrastructure (resorts, transport and communications, tourist support services) be added to what you have just said? Could you explain more about how each of these areas is affected?	A. Chimuanes&M. Semende / Tourism Sofala	Floods and cyclones can cause the destruction of the pleasant environment, destroy tourism support infrastructures, access roads, communication, causing an imbalance in the region's development, particularly in the tourist area	The infrastructure serves as the support and basis for tourism development at a global level, in the Zambezi Valley, due to natural disasters, these are destroyed and tourism ceases to be an apt activity for operators, as well as tourists avoid this region due to the lack of infrastructure and services to provide security throughout the stay. In this, they choose other destinations in the region that provide a diversity of tourist services to the detriment of the Zambezi Valley, although it presents better natural potential if compared with other destinations in the region of southern Africa
			Abilio Nhampa / Tourism Zambezia	Yes, tourism is a complementary activity and the frequency of disasters is a threat to the sector, infrastructures, tourism investments and the influx of tourists, as they fear unpleasant situations and illnesses.	
			Milton Barbosa/ INGD Zambezia	Reduced revenue for tourism operators, local communities and government	
			Portacio / INGD Tete		
			Eduardo Mucavele / Zambezi Agency	When these extreme events hit the region, the infrastructure that guarantees access to the places where the tourism product is consumed is destroyed	
		d) Are the natural disasters in the Zambezi Valley region specific to the region or do they tend to be similar across the country? In terms of intensity and frequency?	Gersones Nunes / Zambezi Agency	They are severely affected and then for a long time cannot get back on their feet to meet tourist demand in the event of natural disasters	The natural disasters (floods and cyclones) observed in the Zambezi Valley region, tend to be similar in almost all the national territory, due to its long coastline on the Indian Ocean, therefore, in the Zambezi Valley the disasters are more frequent and more severe resulting from the location of the region in the intertropical zone between Mozambique and Madagascar, an area of intense cyclonic formation and the Zambezi River that crosses the region in a West-East direction, which is often influenced by rains and discharges from upstream countries, flooding extensive areas downstream
			Jorge Mulaboa / Tourism Manica Province	In the specific case of Manica, it can be said that it directly affects the road network, the south bank of the river becoming incommunicable by land	
			A. Chimuanes&M. Semende / Tourism Sofala	Reduction in the number of rooms and beds, vulnerability in transitivity, destruction of communication services	
			Abilio Nhampa / Tourism Zambezia	Yes, although tourism is based on natural aspects, infrastructures are vital to guarantee minimum conditions of international standards demanded by tourists. Natural disasters constitute a setback for tourism in the Zambezi Valley region	
			Milton Barbosa/ INGD Zambezia	Yes	
e) If there's a difference compared to the Country, what do you think is going on behind it?	Portacio / INGD Tete		The location of the Zambezi Valley region strongly influences the vulnerability to flooding (Zambezi River and its tributaries) and cyclones (inter-tropical convergence centre) in the Indian Ocean between Mozambique and Madagascar		
	Eduardo Mucavele / Zambezi Agency	Natural disasters are similar to those in every country, but in terms of intensity and frequency the region has some specific characteristics			
	Gersones Nunes / Zambezi Agency	They are widespread, but in the Zambezi valley natural disasters are more frequent and have severe impacts			
	Jorge Mulaboa / Tourism Manica Province	are similar from all over the country			
	A. Chimuanes&M. Semende / Tourism Sofala	They are not region specific and tend to be similar in some regions of the country			
	Abilio Nhampa / Tourism Zambezia	The natural disasters in the Zambezi Valley region are similar in type but different in frequency and intensity.			
	Milton Barbosa/ INGD Zambezia	The magnitude of disasters is different, but the frequency is more visible and severe in the Zambezi Valley region due to its geographical location			
	Portacio / INGD Tete				
	Eduardo Mucavele / Zambezi Agency	The natural disasters are similar to those in the whole country, but this region has specific characteristics, as it is located in the basin of the Zambezi River in the case of floods and in the central zone, considered vulnerable to cyclones, the most destructive cyclone ever recorded in Mozambique being cyclone IDAI (2019)			
	Gersones Nunes / Zambezi Agency	They are widespread all over the country			
	Jorge Mulaboa / Tourism Manica Province	There is no difference, because the country's geographical location on the Indian Ocean puts it in the shock zone for these disasters			
	A. Chimuanes&M. Semende / Tourism Sofala	due to climatic changes			
	Abilio Nhampa / Tourism Zambezia	I cannot explain exactly, but the region presents geomorphological conditions for the passage of tropical cyclones and floods, the latter often influenced by heavy rainfall in the upstream countries that flow into the Zambezi delta			
	Milton Barbosa/ INGD Zambezia	Due to the geographical location of the Zambezi Valley			
	Portacio / INGD Tete				

Section 3					
Section 3	1.3 To evaluate to what extent natural disasters, influence tourism in the Zambezi Valley region	a) Zambezi Valley tourist influx	Eduardo Mucavele / Zambezi Agency	Better consultation of tourism statistical data (INE, INATUR)	Frequent floods and cyclones have greatly reduced the flow of tourists to the Zambezi Valley in particular and Mozambique in general
			Gersones Nunes / Zambezi Agency	Natural disasters have led to a drastic reduction in the number of tourists in the region	
			Jorge Mulaboa / Tourism Manica Province	Downward/Declining	
			A. Chimunane&M. Semende / Tourism Sofala	Downward/Declining	
			Abilio Nhampa / Tourism Zambezia	In the region we have two different moments for tourism. The first is in the dry season, considered high for receiving tourists and the rainy season, where tourists tend to be scarce due to several factors (impossibility of access roads, water-borne diseases, frequent threats of cyclones or floods.	
			Milton Barbosa/ INGO Zambezia	Total reduction of tourists due to disasters	
			Portacio / INGO Tete		
		b) Revenues or profits from tourism	Eduardo Mucavele / Zambezi Agency	Better consultation of tourism statistical data (INE, INATUR)	As a consequence of the reduction in the number of tourists, revenue also falls, as the peak tourist season coincides with the summer period, when natural disasters are more likely to occur
			Gersones Nunes / Zambezi Agency	The reduction in the number of tourists in turn precipitates the reduction in revenue	
			Jorge Mulaboa / Tourism Manica Province	Close to non-existent	
			A. Chimunane&M. Semende / Tourism Sofala	They have reduced	
			Abilio Nhampa / Tourism Zambezia	Reduced, as tourists are wary of visiting the region during periods that are considered sensitive (flooding, cyclones or disease)	
			Milton Barbosa/ INGO Zambezia	They have reduced	
			Portacio / INGO Tete		
		c) Tourism infrastructures (hotels and restaurants)	Eduardo Mucavele / Zambezi Agency	The region still has challenges in terms of investment in tourism infrastructure	Most of the tourism supporting infrastructures (hotels, lodges, restaurants, etc.) are built of local materials (sticks and grass) to maintain the natural environment and with the frequency of natural disasters, these infrastructures are totally or partially destroyed, demanding from the owners large sums of money for their repair or reconstruction, often leading to these owners giving up the tourism business or opting to look for other safe regions and countries to apply their investment
			Gersones Nunes / Zambezi Agency	Hotels have not suffered much except those within the peak regions (Floods). Cyclones affect everything from total to partial destruction	
			Jorge Mulaboa / Tourism Manica Province	They suffer a lot, since the quality and low	
			A. Chimunane&M. Semende / Tourism Sofala	Hotels, restaurants and campsites are most affected	
			Abilio Nhampa / Tourism Zambezia	These suffer in two ways: firstly, material damage, destruction resulting from natural disasters and secondly, tourism agents spend large sums of money on reconstruction which, without the occurrence of these phenomena, this money would be used to expand the services provided in order to attract more tourists to the region	
			Milton Barbosa/ INGO Zambezia	Total and partial destruction of infrastructures, as most of them are built with local materials in the region	
			Portacio / INGO Tete		
		d) Access roads (transitability)	Eduardo Mucavele / Zambezi Agency	National roads are passable all year round, but the secondary and tertiary roads linking the tourist areas are impassable. River transport is scarce and almost inaccessible.	Natural disasters condition to a large extent the connectivity between tourist emitting markets and tourist receiving markets and the Zambezi Valley due to its morphological characteristics (swamps), the transitability in these periods is almost non-existent or even null, mainly for the secondary and tertiary roads that connect the tourist consumption points, the main roads are fragile due to their poor quality, and traffic flows in a restricted manner, contrary to the wishes of tourists who require fast and efficient services to reach their preferred locations
			Gersones Nunes / Zambezi Agency	Impassable and in some cases destroyed	
			Jorge Mulaboa / Tourism Manica Province	The main ones are passable all year round. However, the tertiary ones or those that give access to certain attractions become impassable during the rainy season, or even when natural disasters occur	
			A. Chimunane&M. Semende / Tourism Sofala	Precarious	
			Abilio Nhampa / Tourism Zambezia	Natural disasters (floods and cyclones) have as consequences the destruction of roads and bridges that allow the connection between the emitting markets and tourist spots. The impossibility of access roads greatly affects tourism, since tourists cannot reach the tourist areas and the time it takes to repair them is relatively long, which makes the region with enormous potential not a destination of choice at regional (SADC) and international level	
			Milton Barbosa/ INGO Zambezia	Floods have a greater impact on transitability due to the characteristics of the region - marshes and humidity	
			Portacio / INGO Tete		
		e) Transportation (air, land and sea)	Eduardo Mucavele / Zambezi Agency	The country has high prices and is not attractive for national tourism, maritime is really developed for tourism although the country receives cruises from other countries	All these systems are affected equally, since the air, sea and in some cases road systems are all suspended for several days, thus affecting all segments of society and tourism in general
			Gersones Nunes / Zambezi Agency	During the occurrence of floods and cyclones all transport systems are affected and often suspended	
			Jorge Mulaboa / Tourism Manica Province	Land and waterways	
			A. Chimunane&M. Semende / Tourism Sofala	Everyone is affected almost equally	
			Abilio Nhampa / Tourism Zambezia	The occurrence of floods and cyclones often, and depending on the magnitude, conditions air, land and sea mobility. In this case, airports are closed and roads with conditioned traffic and maritime navigation is closed and ports are also closed	
			Milton Barbosa/ INGO Zambezia	Not available	
			Portacio / INGO Tete		
		f) Availability of tourism services and goods	Eduardo Mucavele / Zambezi Agency	They present accentuated ruptures	Tourism service providers are mostly private and the frequent occurrence of natural disasters drives the total closure of these services and in some cases, providers give up the sector due to their exposure and volatility to natural disasters and embrace other less sensitive areas
			Gersones Nunes / Zambezi Agency	Many of the cases cut back as they are by nature weak	
			Jorge Mulaboa / Tourism Manica Province	Close to non-existent	
			A. Chimunane&M. Semende / Tourism Sofala	In the occurrence of a disaster these services are disrupted in the supply of goods. Tourism service providers are mostly private and the frequent occurrence of natural disasters drives the total closure of these services and in some cases, providers give up the sector due to their exposure and volatility to natural disasters and embrace other less sensitive areas	
			Abilio Nhampa / Tourism Zambezia		
			Milton Barbosa/ INGO Zambezia	Totally affected due to lack of mobility	
			Portacio / INGO Tete		
g) Tourist attractions (material and immaterial)	Eduardo Mucavele / Zambezi Agency	There are several, but probably the income capacities of nationals do not allow greater consumption of the tourism product	Natural attractions, even though they have some resilience compared to those made by man, suffer, which in some cases even disappear completely and those made by man are totally harassed as previously presented		
	Gersones Nunes / Zambezi Agency	Natural ones suffer little, but man-made ones depend on their resilience			
	Jorge Mulaboa / Tourism Manica Province	Area with a rich touristic potential. Besides the natural heritage there is in this region built and immaterial cultural heritage that suffers through the resilience observed in each dimension			
	A. Chimunane&M. Semende / Tourism Sofala	Natural, as well as man-made, suffer when disasters occur			
	Abilio Nhampa / Tourism Zambezia	Attractive tourism is based on two aspects: The existing infrastructure and the natural landscape found in each specific area and both are greatly impacted by natural disasters, reaching points where the local attractiveness and totally destroyed and therefore disappear forever			
	Milton Barbosa/ INGO Zambezia	The local tourist heritage suffers great impacts, however, the immaterial one does not occur so much, this, perhaps, is due to lack of consideration by managers of the tourism sector			
	Portacio / INGO Tete				
h) Other (in case there are other areas that are not mentioned here, but are also greatly impacted by extreme events)?	Eduardo Mucavele / Zambezi Agency	As far as I know, there are no other	Nothing to add		
	Gersones Nunes / Zambezi Agency	Nothing to add			
	Jorge Mulaboa / Tourism Manica Province	The area of agriculture, whenever flooding occurs as a result of cyclones, is flooded and results in the loss of crops, opening the way for the emergence of pockets of hunger in the region, which also affects the tourist workers who depend on these products			
	A. Chimunane&M. Semende / Tourism Sofala	Nothing to add			
	Abilio Nhampa / Tourism Zambezia	I would like to insist on the issue of destruction of tourism support infrastructures as a consequence of natural disasters			
	Milton Barbosa/ INGO Zambezia	Nothing to add			
	Portacio / INGO Tete				

ZAMBIA			
a) If you consider the frequency and impacts of natural disasters on tourism, what has been done to better respond in case of occurrence?	Eduardo Musavire / Zambesi Agency	Design and implementation of Contingency and Emergency Plans by the Governments (National, Provincial and District)	The regional government has held awareness-raising sessions for operators, but these actions tend to be reactive and not aimed at preparing tourism operators in regard to better respond in case of natural disasters. INGO, the entity responsible for disaster management at national level, has no specific action to address the impact of natural disasters on the tourism sector
	Gerome Nunes / Zambesi Agency	1. saving human life, 2. restoring basic services, 3. ensuring economic activities through suspension or reduction of labour and tax burdens, 4. general reinstatement	
	Jorge Mulubwa / Tourism Marica Province	The government at provincial level has organized natural disaster management committees that act at various levels. Organized by location, they are equipped with means of communication for warning, material means and equipment for intervention in case of occurrence and advance provision of foodstuffs and first aid for victim situations	
	A. Chimusuka&M. Semende / Tourism Sofala	NO ANSWER	
	Abilio Nhamupa / Tourism Zambezia	Sensitization of tourism operators to opt for resilient infrastructures in order to minimize impacts. This certainly takes away the natural attractiveness of various infrastructures, but it ensures that natural disasters do not bring everything down as has been the case in recent years	
b) What are the organizations that act to mitigate the impact of natural disasters in tourism?	Milton Barboza/ INGO Zambezia	INGO is not very involved in the public sectors to cooperate in finding solutions to mitigate the impacts of natural disasters on tourism, except in situations considered serious in which the sector does not have the technical means to address	There are no organizations focusing on the problem of natural disasters in the tourism sector, but public institutions operating at a national level in disaster management in different sectors of activities. Local disaster management councils do not practice tourism sector, seen as marginal for debate
	Portacio / INGO Tete		
	Eduardo Musavire / Zambesi Agency	National Institute for Disaster Management (INGO), Regional Water Administrations, District, Provincial and Municipal Governments	
	Gerome Nunes / Zambesi Agency	There are none but the government itself through actions as happens in any sector (Tourism Associations)	
	Jorge Mulubwa / Tourism Marica Province	There are no organizations that act specifically to mitigate the impacts on the area of tourism, given that the existing ones act to mitigate these impacts on all the sectors that operate in the region, such as the National Institute for Natural Disaster Management, the Red Cross and Save the Children, which are the most relevant, and there are others that act on a small scale	
c) Is there any relationship or sectoral coordination between tourism and the National Institute for Disaster Management? If yes, can you describe in your own words?	A. Chimusuka&M. Semende / Tourism Sofala	Governmental and non-governmental organizations	Sectorial coordination is based on the safeguarding of human life and there is no need to discuss issues such as tourism, but only to prevent the impacts of natural disasters at local level, but rather to sensitive tourism operators to take resilient actions to reduce damage from natural disasters
	Abilio Nhamupa / Tourism Zambezia	Besides the public institutions, WFP has assumed a prominent role, as it has been engaged in the recovery of natural attractions (non infrastructures) in the Zambezi Valley region, through actions involving local communities	
	Milton Barboza/ INGO Zambezia	The technical council for coordination in the natural disasters sector does not prioritize issues related to the tourism and culture sectors, which are seen as marginal to the debates.	
	Portacio / INGO Tete		
	Eduardo Musavire / Zambesi Agency	It exists. National Institute for Disaster Management is a Mozambican government body which coordinates all actions aimed at minimizing disaster impacts in all sectors of the State. There are local natural disaster management committees, early warning systems, etc.	
d) What is the role of the tourism sector in the Zambezi Valley region, given the vulnerability of the sector? Are there any specific activities to reduce the negative impacts of natural disasters and destruction of locally existing potential?	Gerome Nunes / Zambesi Agency	INGO is a coordinator for the provision of contingency funds and has little intervention in tourism, based on support through special funding lines	The tourism sector is invisible in the region, as there are no specific actions developed by this sector to minimize the impacts of natural disasters at local level, but rather to sensitive tourism operators to take resilient actions to reduce damage from natural disasters
	Jorge Mulubwa / Tourism Marica Province	Yes, there is. In its virtual structure, the Tourism sector is represented in the Emergency Operation Committee. It participates in the planning and decision making for action in the event of a natural disaster	
	A. Chimusuka&M. Semende / Tourism Sofala	Lack of sectoral contribution due to lack of means and initial funds	
	Abilio Nhamupa / Tourism Zambezia	There is no coordination between these sectors, as INGOs focus on disaster management in favor of safeguarding people's lives. Tourism sector only intervenes in standing crops/damage caused by natural disasters	
	Milton Barboza/ INGO Zambezia	Does not exist	
e) Are there any activities to promote the resilience of the tourism sector in the Zambezi Valley region?	Portacio / INGO Tete		Currently there is no specific action to promote tourism resilience in the Zambezi Valley region, as tourism is considered something for rich people and does not respond to the basic needs of people's lives
	Eduardo Musavire / Zambesi Agency	No concrete answer, as I am not aware of any specific actions	
	Gerome Nunes / Zambesi Agency	Tourism sector organization is not visible and investment is not adequate to meet the challenges and all stakeholders must find ways to collectively cooperate to promote the sector overall	
	Jorge Mulubwa / Tourism Marica Province	Being part of the Provincial Natural Disaster Management Committee has with the role of: 1. Disseminating information on natural disaster phenomena to tourism operators, 2. Disseminating disaster or emergency prevention, mitigation and response actions, 3. Guaranteeing the communication of emergencies, 4. Guaranteeing the collection of information on the impacts of disasters that have occurred, 5. Channeling the needs of operators in the post-disaster period to the competent bodies for channeling aid	
	A. Chimusuka&M. Semende / Tourism Sofala	The role of tourism is one of environmental and ecosystem prevention	
f) What are the actions of government entities operating in the Zambezi Valley to promote resilient tourism? Strategies, plans, etc. that can serve as guides in case of natural disasters?	Abilio Nhamupa / Tourism Zambezia	Promote the construction of resilient infrastructure (roads, bridges, hotels, communication, energy) so that the impacts on the sector are minimal and thus ensure the sustainability of the sector at a local level	The National Plans for the reduction of natural disasters, prevent little specific information about the Zambezi Valley region, however, the Zambesi Agency as the entity responsible for promoting the sustainable development of the Zambezi Valley region, has some operative actions of its Development Plan that concern tourism, mainly in: 1. Promotion of tourism routes and packages for the region, 2. Strengthening of tourism infrastructures to attract more investment and tourism, 3. Strengthening of tourism associations
	Milton Barboza/ INGO Zambezia	Does not exist, apart from asking operators to opt for resilient actions	
	Portacio / INGO Tete		
	Eduardo Musavire / Zambesi Agency	I am not aware of any specific actions	
	Gerome Nunes / Zambesi Agency	Promoting resilient tourism but with few specific concrete actions	
g) How is information sharing on the tourism sector done in the event of natural disasters?	A. Chimusuka&M. Semende / Tourism Sofala	Currently there are no exclusive activities, other than those mentioned above	Information sharing is done in a vertical way, top down, in which the central level issues alerts and the provincial delegations carry out dissemination with all social segments, INGOs, cooperation partners, local leaders and communities, civil society, etc. Sometimes this information is presented in order to inform, but rather to be debated and discussed in order to find better solutions to the reality of tourism in the Zambezi Valley
	Abilio Nhamupa / Tourism Zambezia	NO ANSWER	
	Milton Barboza/ INGO Zambezia	The issue of changing the mentality of tourism agents with regard to incorporating techniques that enable infrastructure resilience in the event of natural disasters	
	Portacio / INGO Tete	Tourism is considered a thing of the rich and has not received much attention since it does not immediately answer the question of people's lives	
	Eduardo Musavire / Zambesi Agency	There are the bodies before. From what I know, strategies are drawn up at central level and on the basis of data collected at local level, and it is the local representation of this body that guarantees their implementation at local level	
h) After the occurrence of extreme events, is there a public fund used to guarantee reconstruction by local operators? If yes, what is the criteria of eligibility?	Gerome Nunes / Zambesi Agency	The National Plans for the reduction of natural disasters, prevent little specific information about the Zambezi Valley region, however, the Zambesi Agency as the entity responsible for promoting the sustainable development of the Zambezi Valley region, has some operative actions of its Development Plan that concern tourism, mainly in: 1. Promotion of tourism routes and packages for the region, 2. Strengthening of tourism infrastructures to attract more investment and tourism, 3. Strengthening of tourism associations	The primary responsibility is that of the State. The country as a whole lacks Destination Management Organizations and the private sector, mainly tourism operators, in many cases depend on the State for the execution and viability of their activities
	Jorge Mulubwa / Tourism Marica Province	The sector's actions have been based on the National Plan for Prevention and Response to Natural Disasters	
	A. Chimusuka&M. Semende / Tourism Sofala	The national plan foresees the transfer of all sectors of activities that are in place (suitable for natural disasters, however, it is not an easy task as the burden of these transfers are borne only by the tour operator	
	Abilio Nhamupa / Tourism Zambezia	National plans make little reference to regional specificities. The Zambezi Valley, for the time being, has no plan	
	Milton Barboza/ INGO Zambezia		
i) Do you have anything to add?	Portacio / INGO Tete		There are no funds available for reconstruction in case of natural disasters, although centrally there are regional quotas, but in reality they are not left locally. The Government has approached sponsoring partners to request support for post-disaster reconstruction needs
	Eduardo Musavire / Zambesi Agency	I am not aware of it	
	Gerome Nunes / Zambesi Agency	The sharing of information is done through sectorial interaction, presentation, debate, analysis of all activities, i.e. it is totally participative. Here it is necessary to mention that we need to improve the operationalization and communication mechanisms	
	Jorge Mulubwa / Tourism Marica Province	There is a warning system installed by the Central Government that is applicable to all sectors, and it is up to each one to call the attention of the employees in their sector in the affected or to be affected area	
	A. Chimusuka&M. Semende / Tourism Sofala	NO ANSWER	
j) Do you have anything to add?	Abilio Nhamupa / Tourism Zambezia	The alerts are issued by INGO and INRAN, indicating the courses and possible areas to be affected. The tourism sector at grassroots level, approaches the dissemination of information to the operators covered and after the occurrence collects information that is then shared in sessions of Provincial Governance	Evolution and Operationalization of Tourism Associations to serve as links between the public sector as well as acting in Tourism Destination Management Organizations in the Zambezi Valley Region
	Milton Barboza/ INGO Zambezia	Provincial technical council manages information and shares with central and shared level through national and international newsletters, media, cooperation partners, civil society participate in disseminating information on natural disasters	
	Portacio / INGO Tete		
	Eduardo Musavire / Zambesi Agency	There is primary state responsibility	
	Gerome Nunes / Zambesi Agency	There is, however, no variation, since the actions are done in an isolated and independent way to respond to current needs	
k) Can you say if there is any specific responsibility between public and private sectors, specifically destination management organizations regarding mitigating the impacts?	Jorge Mulubwa / Tourism Marica Province	Yes, there are. The public sector, after gathering information from the affected private sector, seeks help or support mechanisms from management organizations to leverage affected entities	There are no funds available for reconstruction in case of natural disasters, although centrally there are regional quotas, but in reality they are not left locally. The Government has approached sponsoring partners to request support for post-disaster reconstruction needs
	A. Chimusuka&M. Semende / Tourism Sofala	They exist but without knowledge of the sector	
	Abilio Nhamupa / Tourism Zambezia	There are no DMOs in the Zambezi Valley region. The tourism portfolio of the provincial REC is totally dependent on public sector funding, which makes it a hostage in the execution of its activities	
	Milton Barboza/ INGO Zambezia	There are no existing tourism destination management organizations in Mozambique	
	Portacio / INGO Tete		
l) Do you have anything to add?	Eduardo Musavire / Zambesi Agency	After Cyclone Idai, partner funds were mobilized to support the public sector (through the creation of a post-cyclone reconstruction office) to recover destroyed infrastructure and the creation of a public fund to support the private sector for the National Investment Bank (INB) Emergency Recovery post-cyclone productive capacity	Evolution and Operationalization of Tourism Associations to serve as links between the public sector as well as acting in Tourism Destination Management Organizations in the Zambezi Valley Region
	Gerome Nunes / Zambesi Agency	No funds are available for reconstruction. Each operator is responsible for the reconstruction and the public infrastructures by the Government with the support of cooperation partners	
	Jorge Mulubwa / Tourism Marica Province	No. After emergencies, the Government seeks funds from its partners to respond to the impacts created, and with the same partners it finds mechanisms to respond to the tourism sector, following eligibility criteria	
	A. Chimusuka&M. Semende / Tourism Sofala	We have accompanied but without involvement of the sector that regulates tourism activity	
	Abilio Nhamupa / Tourism Zambezia	It does not exist. The government has talked in the media about the existence of a fund to support operators in case of emergency, but in reality this fund does not exist	
m) Do you have anything to add?	Milton Barboza/ INGO Zambezia	The national contingency plan, where each sector is represented with some quotas to respond to sectoral needs at central level with no effect on the province	Evolution and Operationalization of Tourism Associations to serve as links between the public sector as well as acting in Tourism Destination Management Organizations in the Zambezi Valley Region
	Portacio / INGO Tete		
	Eduardo Musavire / Zambesi Agency	No additions	
	Gerome Nunes / Zambesi Agency	Need to strengthen and operationalize Tourism Associations at grassroots level	
	Jorge Mulubwa / Tourism Marica Province	Yes, dealing with situations that are beyond the reach of any organization as well as the Government itself, one should move towards the creation of permanent local Quad Questionnaires with which the capacity to intervene without necessarily the direct intervention of the Central Government as has been the case at present	
n) Do you have anything to add?	A. Chimusuka&M. Semende / Tourism Sofala	Protection of coastal area, through the planting of mangroves	Evolution and Operationalization of Tourism Associations to serve as links between the public sector as well as acting in Tourism Destination Management Organizations in the Zambezi Valley Region
	Abilio Nhamupa / Tourism Zambezia	Yes, I would like to stress that there is no fund for support and even less DMOs	
	Milton Barboza/ INGO Zambezia	Nothing to add	
	Portacio / INGO Tete		
	Eduardo Musavire / Zambesi Agency		

Section 5					
Section 5	1.5 Propose resilient or sustainable measures to mitigate the impacts of natural disasters on tourism in the Zambezi Valley region	a) Based on your experience and the challenges posed by the frequent occurrence of natural disasters in the region and the negative impact on local tourism, is there a way to respond so that damage from these phenomena is kept to a minimum?	Eduardo Mucavele / Zambezi Agency	At national level this could be through the creation of sector-specific strategies for the tourism sector	Firstly, in order to minimize the impacts of natural disasters on tourism, it is necessary that tourism operators find mechanisms that do not depend exclusively on State intervention in almost all stages of this value chain; secondly, to promote resilient actions in the tourism sector, based on the exaltation of local knowledge, which is often neglected; and thirdly, the need to find a functional and sustainable balance point between the private sector and the government in the search for golden solutions for disaster-resistant tourism in the Zambezi Valley
			Gersonne Nunes / Zambezi Agency	Tourism cannot be dependent on government...tourism agents must work in a collective and coordinated manner to implement initiatives to promote the sector, etc.	
			Jorge Mulaboa / Tourism Manica Province	Yes, there are. All citizens and tourism operators living in the Zambezi Valley region, whenever they are informed of a disaster of any kind, should move away from these areas and evacuate their goods to safe areas	
			A. Chimune&M. Semende / Tourism Sofala	The first would be resilient buildings and the protection of these areas by planting mangroves or other species	
			Abilio Nhampa / Tourism Zambezia	Yes, this is a recurring issue, but as I said before, the promotion or sensitization of tourism operators to build resilient tourism infrastructures can be a way out and in the future reduce the losses currently experienced	
			Milton Barbosa/ INGO Zambezia	Resilience and sustainability based on local material, local knowledge that is often neglected. Accountability as a structural issue to respond fully to the challenges of natural disasters involving all sectors	
			Portacio / INGO Tete		
		b) Do you currently have a distinction of specific responsibilities between public and private tourism actors?	Eduardo Mucavele / Zambezi Agency	From their knowledge, the public has specific responsibilities in disaster management	As much as they exist, at the present time they are not viable, since the State is the first actor in this problematic and the merely sporadic sector, always following the State, has not done much to minimize the problem that affects the latter as well as a large part of the operators
			Gersonne Nunes / Zambezi Agency	Yes, there are, but private agents are always trailing the state, which dictates a contradiction since in the world the private sector is a financier of the state	
			Jorge Mulaboa / Tourism Manica Province	Yes	
			A. Chimune&M. Semende / Tourism Sofala	NO ANSWER	
			Abilio Nhampa / Tourism Zambezia	I am not aware of this	
			Milton Barbosa/ INGO Zambezia	As far as I know, there are not exist	
			Portacio / INGO Tete		
		c) What would be the best actions to consider for resilient tourism, given that natural disasters are not possible to eliminate?	Eduardo Mucavele / Zambezi Agency	Without answer	The creation and operation of tourism associations that implement resilient and sustainable plans in which the public sector serves as a provider of general plans
			Gersonne Nunes / Zambezi Agency	The success of tourism depends on the support of local tourism associations	
			Jorge Mulaboa / Tourism Manica Province	In times of rain and cyclones avoid any type of tourism in the Zambezi Valley, comply with the appealing messages disseminated to avoid high-risk impacts	
			A. Chimune&M. Semende / Tourism Sofala	NO ANSWER	
			Abilio Nhampa / Tourism Zambezia	resilient tourism infrastructures	
			Milton Barbosa/ INGO Zambezia	Sustainable and resilient actions	
			Portacio / INGO Tete		
		d) Is it possible to have resilient tourism in the Zambezi Valley that has little resentment towards the adverse impact of natural disasters? Comment.	Eduardo Mucavele / Zambezi Agency	It is possible because the other sectors of the country already have sectional strategies to mitigate natural disasters, which allows for specific actions and funds in contingency plans to maintain the development of activities throughout the year even in emergency situations	In order to have a resilient and functional tourism sector in the Zambezi Valley region, it is fundamental to look at the road infrastructures as a means of tourism support, but also as safe escape routes for tourists in the event of natural disasters. This is only possible if at the local level there are tourism associations with executive powers to enable activities in the sector
			Gersonne Nunes / Zambezi Agency	Yes, but we need to empower local associations to better respond to the challenges facing tourism	
			Jorge Mulaboa / Tourism Manica Province	Yes provided that managers and practically observe resilient measures	
			A. Chimune&M. Semende / Tourism Sofala	NO ANSWER	
			Abilio Nhampa / Tourism Zambezia	No. Natural disasters will continue and perhaps with greater frequency and severity, and this will mean that actions that are currently considered effective may not be so in the future and thus perpetuate regional exposure to these phenomena	
			Milton Barbosa/ INGO Zambezia	Yes, it is possible, as long as we have access roads that not only transport goods and services, but also serve as immediate evacuation routes for tourists in case of floods. Building infrastructure in high areas to prevent damage from floods and cyclones	
			Portacio / INGO Tete		

Data analysis process

Anchor Codes

1. Causes
2. Threat
3. Consequences
4. Solutions

1. Compile the Codes

2. Causes: Droughts
3. Consequences: climate change
4. Threat: Floods and cyclones

...

2. Arrange Alphabetically

...

3. Consolidate the Codes

Causes: Floods, Cyclones **15**, and droughts **3**

Causes: Geographical location with influences on upstream flow to ZVR **4**

Consequence: reduction of revenue **6**

Threat: Lack of coordination, collective actions due to limited funds **3**

Threat: Non-existence of Public funds for reconstruction **6**

...

7 Sort codes

How natural disasters affect tourism in Zambezi Valley region?

Cluster 1	Cluster 2	Cluster 3	Cluster 4
<ul style="list-style-type: none"> Floods, Cyclones 15 droughts 3 Geographical location of ZVR 4 More frequency and intensity due to its geographical location 5 	<ul style="list-style-type: none"> Destruction of tourism support infrastructures 7 Give up of service providers due to exposure and volatility of tourism 4 Highly prone to the destruction of operator's investments 1 Partial and total destruction of infrastructures 3 reduction in # of tourists 5 reduction of revenue 6 total affected due to lack of mobility 3 Affects or destruction of tourism supporting means 5 Tourists give up to visit the region 1 roads linking tourism areas are impassable 4 	<ul style="list-style-type: none"> Non-existence of Public funds for reconstruction 6 Each operator is responsible for the reconstruction 1 Non-existence of coordination between INGD and tourism sector 4 implemented plans are drawn up at the central level, without much influence from tourism managers in the Zambezi Valley 2 Lack of coordination, collective actions due to limited funds 3 Public sector responsibility 3 Non-existence of DMO in Mozambique 2 There is no exclusive activity for resilience in tourism 2 	<ul style="list-style-type: none"> Dissemination of information on natural disasters to tourism operators 6 Natural disaster management committees to intervene in tourism 2 Strengthen of Tourism Association in the Zambezi Valley region 1 Solution: tourism operator's sensitization on resilient infrastructures 2

8 Label Clusters/Themes

Cluster 1: Frequency and intensity of natural disasters due to its geographical location 9 Flood & cyclones 15	Cluster 2: Infrastructure and tourism support services volatility 27	Cluster 3: Lack of coordination, collective actions due to limited funds 10	Cluster 4: Dissemination of information on natural disasters to tourism operators 6
Droughts 3	Reduction in # of tourists 5 Reduction of revenue 6 Tourists give up to visit the region 1	Plans are drawn up at the central level, without much influence from tourism managers in the Zambezi Valley 2 Public sector responsibility 3 Non-existence of DMO in Mozambique 2 Non-existence of resilience tourism actions 2	Natural disaster management committees to intervene in tourism 2 Tourism operator's sensitization on resilient infrastructures 2