

Creating the destination of tomorrow: Defining Destination Resilience under climate change pressure in the Harz Region (Germany)

BSc Tourism Thesis



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Abstract

There is absolutely no doubt that climate change is one of the major problems causing enormous threats to eco- and human systems. Nature-based tourism destinations such as the Harz (Germany) highly depend on its natural resources and need to react to the challenges climate change creates for them. The sustainability concept is widely applied in tourism's adaptation to climate change, however, it shows its difficulties in being successfully implemented in dynamic tourist destinations. Destination resilience is a relatively new concept which can help to prepare destinations to adapt effectively to climate-change impacts on the long-term. The goal of this paper is to determine the impacts of climate change on the Harz tourism system and how its resources become vulnerable. Eventually, it aims to find feasible adaptation methods to increase destination resilience. A mixed-methods approach including stakeholder interviews, desk research and content analysis is used to characterize the destination's sensitivities and determine the suitability of current tourism development goals to prepare for a future heavily impacted by storms, floods, temperature increase and bark beetle plagues. The development goals were found to be partly matching, partly mismatching with those effects, which draws the attention to complex problems beyond the impacted activities. Issues in stakeholders networking, the recognition of the climate change as a threat, power and politics, as well as investment were found to be the key issues which need to be addressed to improve destination resilience. Finally, recommendations on how to improve destination resilience are given to local actors.

Keywords: resilience, destination resilience, climate change, destination management, adaptation

Die Auswirkungen des Klimawandels stellen den Harz vor große Herausforderungen. Ein erhöhtes Vorkommen von starken Stürmen und Überflutungen sowie ganzjährig wärmere Temperaturen beeinflussen die Tourismusindustrie wie wir sie heute kennen. Die Idee, den Tourismus nachhaltiger zu gestalten und somit Klimaveränderungen vorzubeugen hat sich bisher noch nicht als erfolgreich bewiesen. Das Konzept des widerstandsfähigen Tourismus kann Tourismusgebieten wie dem Harz helfen, sich effektiv und langfristig auf die sich verändernden Verhältnisse vorzubereiten. Die Analyse zeigt, dass die Entwicklungsansätze des Zukunftskonzepts Harz 2025 teilweise dazu beitragen die Region widerstandsfähiger zu gestalten, jedoch auch teils diesem entgegenwirken. Das grundlegende Problem liegt demnach bei Unstimmigkeiten in der gebietsübergreifenden Zusammenarbeit, der Anerkennung von Klimawandel als ein touristisches Problem, unausgeglichene Machtverhältnisse und umstrittenen Investitionen. Lösungsansätze zu jedem dieser Problembereiche werden präsentiert.

1. Introduction

In recent years, climate change has become a well-discussed topic among academics, industries, societies and governments. It has been proven that it directly affects ecosystem services and the well-being of people by implying complex changes like for instance shifting seasons and rainfall patterns, increasing temperatures and changes in flora and fauna (Scott et al., 2012). In other words, these impacts make a great change to the world we know today. Industries and businesses of all kinds are impacted in their operations by climate change and conditions once taken for granted are changing. Climate is considered a key resource for tourism (UNWTO, 2007). The tourism industry depends on the environment as its main resource while it constantly changes environmental condition through changes in land use, natural resource demand and pollution (Cooper, 2012). More than most other industries, tourism depends on its social, economic and environmental conditions simultaneously. The tourism industry is complex and relies upon many factors matching like puzzle pieces which makes it fragile to changes imposed on either one of them (McKercher, 1999). Tourism destination managers should caution changes in its resources and prepare for those changes to ensure long-term sustainable development.

In 2016, the Harz Tourism Association ("Harzer Tourismusverband", HTV) published its Tourism Vision 2025 ("Zukunftskonzept Harz 2025"). The vision defines sustainability as a core concept in destination development while nonetheless not considering climate change implications (HTV, 2016). Especially the Harz's nature-based offer appears to be vulnerable to climate change. Global warming directly impacts the functioning of the ecosystems tourism depends on for scenery and unique assets more than in other comparable destinations (Kreilkamp et al., 2013). The complexity of the system creates a need for management to be flexible and adaptable to changes (Farrell & Twinning-Ward, 2004). The all-year-round destination is impacted especially in the winter season and in need to create resilience toward this stressor by actively taking measures for adaptation.

Nowadays, most tourism destination management organisations (DMO's) consider sustainable development as the best solution for long-term tourism development. Although there has been much written about the sustainability concept regarding tourism destinations, most DMO's are still unsure about specific actions and procedures in making their destination more sustainable (Wagenseil & Zemp, 2016; Walker et al., 2004). Challenges in applying its theory to practice brought up a new approach, the concept of tourism destination resilience. Other than sustainability, the resilience approach considers change as an opportunity to develop rather than as a threat to a system's equilibrium (Calgaro et al., 2014). Scholars argue

that other than trying to prevent climate change impacts, businesses should envision their future under the new conditions and actively prepare for that (Orchsiton et al., 2016; Becken, 2013; Luthe & Wyss, 2014; Espiner & Becken, 2014). Calgaro et al. (2014) developed a framework to analyse destination resilience based on the complex system tourism industry finds themselves in.

This research adds to academic literature as resilience frameworks are yet little applied to tourism destinations' adaptive capacity towards climate change (Calgaro et al., 2014; Becken, 2013). Wagenseil & Zemp (2016) see an opportunity in increasing local knowledge by creating more partnerships between DMO's and research universities. This paper reacts upon this by connecting the academic analysis of resilient tourism development with possibilities for DMO's to actively incorporate adaptation methods in their sustainable tourism development visions. This is done in form of a case study on the Harz tourism system. Based on the identified research gap, the research objective is to contribute to improving destination resilience for climate change in the Harz region by applying Calgaro et al (2014)'s framework. In specific, the following research questions will be answered.

Main Research Question:

How can the Harz tourism system increase its destination resilience under the pressure of climate change implications?

Specific Research Questions:

1. How vulnerable is the Harz Tourism System to the projected climate change-related shocks and stressors?
2. How compatible are the Harz's current tourism development goals with the projected climate change implications?

To address those research questions, a qualitative analysis building upon secondary data and primary data from stakeholder interviews is conducted. First, an extensive literature review will introduce concepts and models relevant to the study. The concept of destination resilience is relatively new to tourism research and will be covered more thoroughly. The literature review leads to a conceptual framework which will guide the analysis. In the methods section, it is explained how each secondary research question can be approached and answered based

on findings within the framework. The findings section answers the research questions step by step. Followed by the discussion, in which the findings are interpreted based on their meaning in destination management and limitations of the study are outlined. Finally, concluding remarks and ideas for further research are presented.

2. Literature review

2.1 Destination Sustainability

Nowadays, the term “sustainable” is a buzzword used widely in relation to development. The principle is defined as a “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (UN Brundtland Report, 1987). While its overall understanding is widely accepted, its vagueness, delusion and hypocrisy make it also a highly contested and fuzzy term. Essentially, sustainable tourism development is defined as “tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities” (UNWTO, 2018). On a local basis, sustainable development is understood as conservation of resources and culture, stakeholder cooperation and education as well as supportive research in monitoring and solving problems (Sharpley, 2010). Sustainability is argued to be the key for balanced eco-systems, growth and competitive advantage in tourism destinations on a local and global level.

DMO's widely took up the sustainability concept for tourism planning activities. However, its implementation is often yet insufficient in achieving desired effects (Wagenseil & Zemp, 2016). Espiner et al. (2017) explain this with the fact that stakeholders are using the concept and modify it to their specific interests. By doing that the idea of sustainable tourism is separated from sustainable destination development which requires a holistic approach (Espiner et al., 2017). In fact, destination managers appear to be undecided about what sustainable tourism means and how to give the right incentives and create a participated process to achieve it (Wagenseil & Zemp, 2016). In recent years, many businesses and communities in environmentally threatened areas have actively engaged in developing emergency plans for sudden environmental threats and developed capacity for “incremental threats to their longevity” (Espiner et al., 2017, p.1386). However, only a few have worked with paying attention to the complexity of systems (Farrell & Twining-Ward, 2004). Espiner et al (2017) argue that change is a crucial part of those systems and constant adaptation a prerequisite for sustainable development. Nowadays, climate change is one of the key factors that accelerate system change and require adaptation.

2.2 Climate Change

Climate change is a wicked problem which is generated globally and implicates incremental changes to a varying extent in every place (Pütz, 2008). This is wicked as people neither agree on a specific problem nor have a solution to solve it (Roberts, 2000). Climate change is understood as 'significant changes in the long-term average weather patterns, which in turn shift the climatic characteristics of a region over time to new conditions' (Dwyer et al., 2007). Its complexity is partly derived from the fact that place-specific changes are hard to predict (McGinnis, 2016). While the sustainability approach considers climate change as a problem to be mitigated, it can also be seen as an opportunity to develop in a different direction (Becken, 2013; Pelling, 2011). Through "adjustments in natural or human systems in response to actual or expected climatic stimuli or their effects" (Pelling, 2011, p.20), adaptation to climate change can open new opportunities for society and industry.

The relationship between global climate change and tourism development was first emphasized in the 1980s (McBoyle & Wall, 1987). Climate change stresses tourism subsystems which are already weakened by seasonality and inflexibility due to competition (Becken, 2013). More than most industries, the tourism industry is highly dependent on unstable factors such as weather and natural assets. Another threat is the impact of climate change on tourist generating markets which creates additional uncertainty from the demand side (Biggs, 2001). First attempts of including sustainability into tourism planning were highly based on local contexts and changes. Nowadays, increased by climate change, the traditional sustainability approach is seen as insufficient as developments and adoption need to also accommodate for global changes in society and environment (Espiner et al., 2017). In the DAVOS Declaration of 2007, the UNWTO requests the tourism industry to take the lead in implementing incentives to climate change mitigation. The destinations should "strive to conserve biodiversity, natural ecosystems and landscapes in ways which strengthen resilience to climate change and ensure a long-term sustainable use of the environmental resource base of tourism" (UNWTO, 2007, p.3).

In fact, there is still a general lack of understanding of the impacts of climate change among stakeholders (Espiner & Becken, 2014). Uncertainty about the capacity of tourism operators to adapt and the incompatibility of most business plans with climate change considerations, make destinations unaware of the consequences of climate change on tourism operations (Scott et al., 2012). However, especially climate variability and weather conditions are essential to be understood in the tourism industry (Espiner & Becken, 2014). Becken (2013),

for example, warns mountain resorts against the disappearance of winter sport activities due to climate change. Winter sport appears to be highly sensitive to weather conditions such as too much or too less wind, fog, rain or snow. Little diversified winter tourism could “result in a regime shift from [an] all-year tourist destination, into a summer-season resort” (Becken, 2013). This implicates great threats to the destination’s resilience, which the next section is based on.

2.3 Destination Resilience

Espiner et al. (2017) see difficulty in applying the sustainability approach with threats created by climate change and take that as an incentive to approach destination management from a new perspective, the resilience framework. While “sustainability emphasises mitigation to prevent change” (Espiner et al., 2017, p. 1390), resilience “adapts to change by building in capacity” (Espiner et al., 2017, p. 1390). As change is imposed from the outside, adaptation seems more suitable than prevention of change. Further, they argue that adaptive resilience is, in fact, a prerequisite for sustainable destination development. Sustainability goals such as network creation and the creation of an integrated sustainability plan (Sharpley, 2010) can be facilitated by a shared resilience thinking among stakeholders.

2.3.1 Defining Resilience

The term resilience has its origin in ecosystem research and was first used by Holling in 1973 (Holling, 1973; Becken, 2013). Holling (1973) defined resilience as the “measure of the persistence of systems and of their ability to absorb change and disturbances and still maintain the same relationships between populations or state variables” (p.14). Since then, the concept has expanded into community and business research and is nowadays used to describe complex problems of adaptation to shocks and stresses of complex systems. It is argued that all actions within a system influence its resilience in some way, therefore managing a system towards increasing resilience is of utmost importance (Walker et al., 2004). Resilience starts with the actor’s overall awareness of the system’s complexity (Orchiston et al., 2016) and their ability to read signals of change early (Espiner & Becken, 2014). The ability to withstand external shocks highly depends on the learning capacity and herewith the degree to which the system can organize itself when changes are imposed (Espiner & Becken, 2014; Sheppard & Williams, 2016). System learning then becomes useful when it is effectively translated into planned resilience, the minimizing of impacts on the system, and adaptive resilience, the fast and efficient reaction to changes (Orchiston et al., 2016). This marks the most essential distinction to traditional sustainability approaches as resilience thinkers see change as an opportunity rather than a problem (Lew et al., 2017).

2.3.2 Resilience in the tourism context

Tourism destinations are complex systems which are linked to a wider socio-ecological context and shaped simultaneously by several drivers. A cascade of overlapping events which hits a destination system at its vulnerable points can destabilize communities and businesses over time (Espiner et al., 2017). Here, resilience can be an effective planning tool to increase the adaptive capacity of the industry but also other social, economic and ecological systems at the destination through collective management (Orchiston et al., 2016; Becken, 2013; Walker et al., 2004). Tourism resilience can therefore be defined as the capacity to maintain the stability of the regional tourism-related economy while ensuring flexibility for innovation and development (Luthe & Wyss, 2014).

In a tourism context, resilience can be considered an important factor in destination sustainability. Sustainability is the balance between economic, environmental and social demands, while resilience demands constant adaptation and change in the complex system. Although these concepts are internally different, adding a resilience perspective to sustainable tourism development plans can greatly strengthen them. In times of high ecological uncertainty and global risks, tourism needs to be flexible and adaptive to be sustainable. Long-term sustainability can be reached more effectively when resilience is integrated into tourism planning (Espiner et al., 2017).

2.3.3 Selected Resilience Models

In the past years, several scholars have taken up the complexity of resilience and created models to measure it (Becken, 2014; Walker et al., 2014; Lew, 2014; Calgaro et al., 2014; Lew et al., 2017). While Walker et al. (2014) and Becken (2014) use a theoretical framework to define the threshold between an existing and a possible future system, most other scholars frame how resilience is shown at a defined place (Lew, 2014; Calgaro et al., 2014; Lew et al., 2017). Among a great variety of models about destination resilience, the most important to this study are the ones which aim to measure destination resilience to climate change implications.

Lew (2014) sees three streams of resilience research which are concerned with the physical environment, the social role in change, and the meaning of 'adaptation' as a constant in our lives. Those concepts are addressed in Calgaro et al.'s (2014) framework of a sustainable destination. The model is one of the most extensive and covers the complexity of the tourism

industry. It considering factors from the economic, social, environmental, governmental and tourism-specific perspective while viewing resilience as a dynamic factor being continuously influenced by the interplay of various internal and external factors.

2.3.4 Destination Sustainability Framework

The 'Destination Sustainability Framework' is based on the assumption that the sustainability of a destination depends on its vulnerability and corresponding resilience as well as the collective learning of stakeholders (Calgaro et al., 2014). To define destination resilience, the model includes six place-bound factors (Figure 1). Those are 1) the external *shocks and stressors* imposed on a destination, 2) internal *vulnerabilities* within the system, 3) the actor's *dynamic feedback loops* within the system, 4) the internal *causes and drivers* of change, 5) the *scale* of impacts and actions, and finally 6) the *time frames* in which changes take place (Calgaro et al., 2014). Shocks and stressors account for rapid and slow events at the destination or outside the destination which disrupt the system and are often caused by human-environment interactions. Climate change can be considered such a stressor.

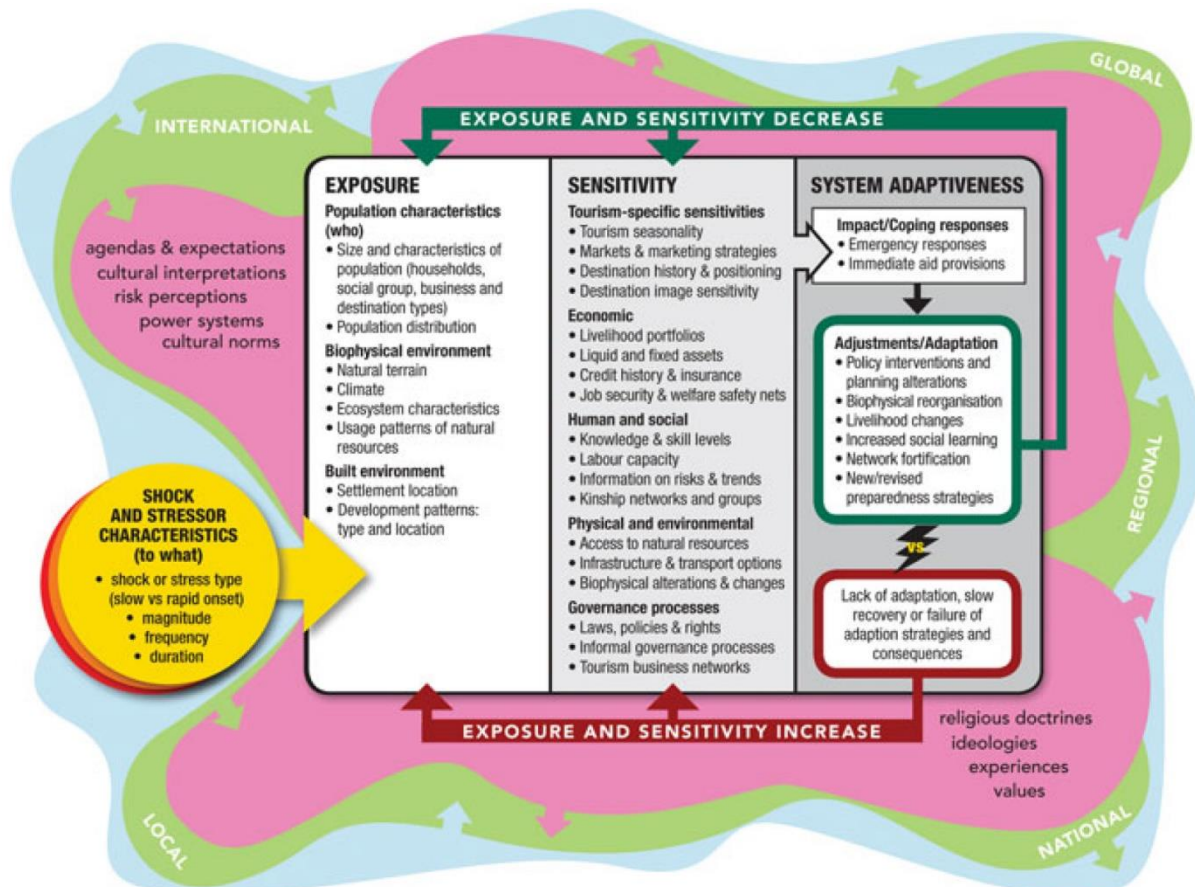


Figure 1. Destination Sustainability Framework (Calgaro et al., 2014)

It impacts the tourism destination in various ways. Identifying those impacts is the core of the model and is compromised in three categories namely exposure, sensitivity and system adaptiveness.

Exposure

Exposure is the “degree to which an exposure unit (who or what) comes into contact with stressors and shocks” (Calgaro et al., 2014, p.348). It is important to define the speed, rate and magnitude the stress exposes the system and the space it impacts (Lew at al., 2017; Calgaro et al., 2014). Climate change directly impacts the biophysical environment which has an impact on flora and fauna, local population and built environment. How and to what extent climate change becomes evident at the destination is the key outcome of the exposure analysis.

Sensitivities

Destination sensitivity is understood as the degree to which the tourism system is affected by the exposures of stress (Calgaro et al., 2014). In other words, how the system is vulnerable to the threats climate change brings along. The destination’s sensitivity to climate change implications is a complex interplay of “social, economic, political and ecological conditions that shape a destination’s capacity to effectively prepare, respond and recover from a shock to the tourism system” (Pyke et al., 2016, p. 54).

The local tourism system incorporates conditions that constantly need to respond to exposures. It is assumed that the more capital and flexibility a destination has available for adaptation processes, the lower its sensitivity to stresses (Calgaro et al., 2014). A vulnerability arises when the system is unable to cope with the effects of stressors, e.g. climate variability and extreme caused by climate change. Vulnerabilities can increase by various factors inside and outside the tourism system (Figure 2; Calgaro et al., 2014). More vulnerability does not mean less resilience or the other way round. In fact, high perceived resilience based on past can lead to more vulnerability through unawareness (Espiner & Becken, 2014). However, to assess and improve destination resilience, place-specific vulnerabilities need to be understood and monitored (Calgaro et al., 2014).

Factors increasing vulnerability (Calgaro et al., 2014)

1. Reliance on external marketing
2. Travel motivation & consumer choices
3. Institutional flexibility
4. Destination remoteness & inaccessibility
5. Place-specific factors
6. Ecologically sensitive & hazard-prone
7. Livelihood dependency
8. Seasonality
9. Access to resources
10. Image sensitivity to risk
11. Limited disaster preparedness

Figure 2 - Vulnerability

System Adaptiveness

Having defined the exposure and sensitivity of the destination to the stressors, its ability to adapt determines the long-term resilience. The available capital impacts the destination's possibilities for short-term responses which pave the way for longer-term adaptation measures (Calgaro et al., 2014). The ability to adapt is the key to long-term success and therefore needed for resilient development. The main factor in adaptability, regardless of the origin and impacts of the event, is the social network organising the adaptive processes. Collectivity, actor networking and communication cycles incorporate feedback loops and are the key to successful adaptation (Calgaro et al., 2014). In addition to this network, available capital (economic, environmental, social, governmental, tourism-specific), effective governance structures and the capacity to learn are needed (Calgaro et al., 2014).

Adaptation is the capacity of humans to influence and manage resilience in a system (Walker et al., 2004). It is taking place at a destination in "response to a perceived risk or opportunity" (Pelling, 2011, p.20). When talking about sustainability and climate change, it goes beyond trying to survive better and incorporates changing basic structures to facilitate life changes (Pelling, 2011). However, the concept of adaptation should be used with care as it is not always the best solution. In fact, tourism resilience may oppose a resilient host community. This is the case, for example, in staff contracts. While seasonal workers increase tourism resilience through its flexibility, community resilience is threatened through insecure employment and income (Becken, 2013). DMO's play a significant role in system adaptation (Becken, 2013) as they hold a holistic perspective of the local tourism industry and are often the ones responsible for developmental leadership (Bornhorst et al., 2010). Their overarching function and knowledge can give them the power to facilitate stakeholder networking and adaptive change (Beritelli & Laesser, 2011; Song et al., 2013).

2.3.5 Summary Resilience

Overall, this section has developed by introducing resilience based on its various definitions and models towards approaches to determine destination resilience. The usefulness of this concept in relation to tourism development is evident, however, one important limitation should not be overseen. Resilient development is cost intensive as it relies on additional, otherwise redundant, resources. Destination communities are often not able to afford resilience improving measures by themselves and are depended on governmental subsidies for their efforts. In this way, contesting agendas across governance levels may decrease actual destination resilience (Lew et al., 2017). Therefore, crucial questions to ask are "Resilience of what to what?" and "How can resilience-thinking facilitate positive change rather than

generating additional stress?”. The resilience of tourism activities to climate change is the question which is answered in this research.

3. Material & Methods

3.1 About the region

The Harz is the most northern low mountain range in Germany and spreads over 110 km from west to east and 40 km from north to south. The touristic zone, which includes the Harz National Park as well as its surrounding areas, counts about 5900km² and is located in the provinces of Lower Saxony, Saxony-Anhalt and Thuringia. The local Tourism Association Harz (HTV) operates for the districts Goslar, Osterode am Harz, Harz, Mansfeld-Südharz and Nordhausen as well as the town councils of Aschersleben, Duderstadt, Bad Gandersheim and Northeim (see Figure 3: Area regulated by HTV (HTV, 2016)). Being founded in 1904, the HTV is mainly responsible for marketing the region as a tourism destination. Since the German reunification in 1989, the HTV has taken efforts in integrating the western and eastern parts of the Harz into one destination. The area is multifaceted, and the tourism pull factors various of cultural, natural and leisure-based nature (HTV, 2016). Trekking, hiking, mountain biking and climbing in summer, as well as tubing, skiing, snowboarding, cross-country skiing in winter are the main pull factors. The natural flora and fauna of the region are unique in the areas as altitude levels from 100m up to 1000m N.N. offer a diverse flora and fauna with threatened species such as the lynx and red deer (Kreilkamp et al., 2013). From a cultural point of view, castles, half-timbered cities, churches and monasteries remind of the time when the region was an important area for the German kingdom. Old authentic coal mines portray the long tradition of coal mining in the area. Beyond that, the region increased its importance as a health and event destination in the past years (HTV, 2016).

In 2015, the region counted more than 6.3 Million overnight tourists with distributed around the region. Currently, the main target group of the region are seniors and “traditionals” who know the area for many years and visit frequently (HTV, 2016). In contrast to rising tourist numbers, the number of inhabitants has decreased up to 24% in the past 20 years. Tourism accounts for 6.8% of local GDP which is somewhat higher than the national average of 4.4% (HTV, 2016). Recently, the HTV published their Tourism Vision 2025 (original: “Touristisches Zukunftskonzept Harz 2025”) as a guideline for tourism developments in the region. I will briefly summarize its key concepts and ideas.

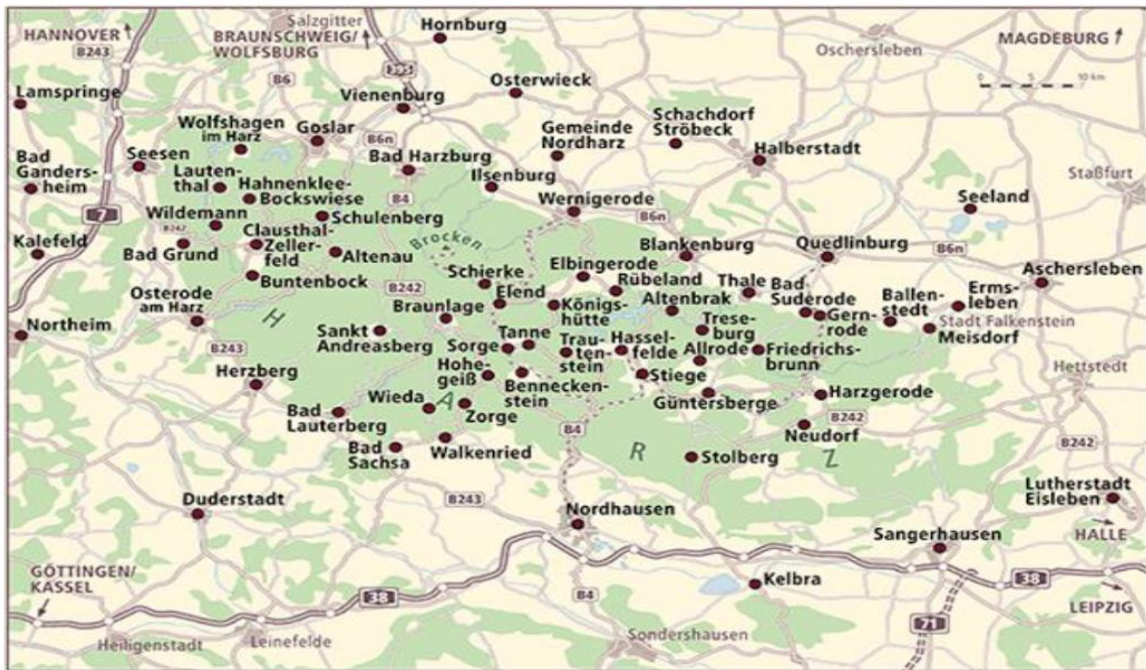


Figure 3: Area regulated by Tourism Association Harz

3.1.1 The Vision “Harz 2025”

The Vision Harz 2025 aims to contribute to an integral and sustainable development of the region by securing the long-term economic success of the sector. Next to creating a common identity, the vision also emphasizes the importance of freedom for the individual stakeholders. The document is built upon a short analysis of the current tourism situation and prospected societal shifts and holiday trends. Crucial to this development plan is the organisational structure of tourism management in the region which is responsible for implementing them. A short description will be given, as this helps to understand the scope of envisioned actions. Afterwards, a general overview of the key aspects within the vision is given.

Organisation of Tourism Management Harz

The general meeting of the HTV counts more than 200 members across districts and aims to incorporate diverse interests for vision making. Outside the general meeting, tasks and responsibilities are divided. While the HTV takes over some of the functions of a Destination Management Organisation, the traditional organizational structures limited them in their possibilities for action (Figure 4a & 4b). In fact, the responsibilities to manage tourism in the area are divided between the Tourism Association and two smaller actors namely Regionalverband Harz e.V. and Harzclub e.V. (Figure 4a). The Harz Tourism Association operates as an umbrella organisation for many of the tourism businesses in the region while

the non-profit organisations Regionalverband Harz e.V. protects nature and monuments¹ and the Harzclub e.V. offers a variety of cultural and nature-based activities to locals and tourists².

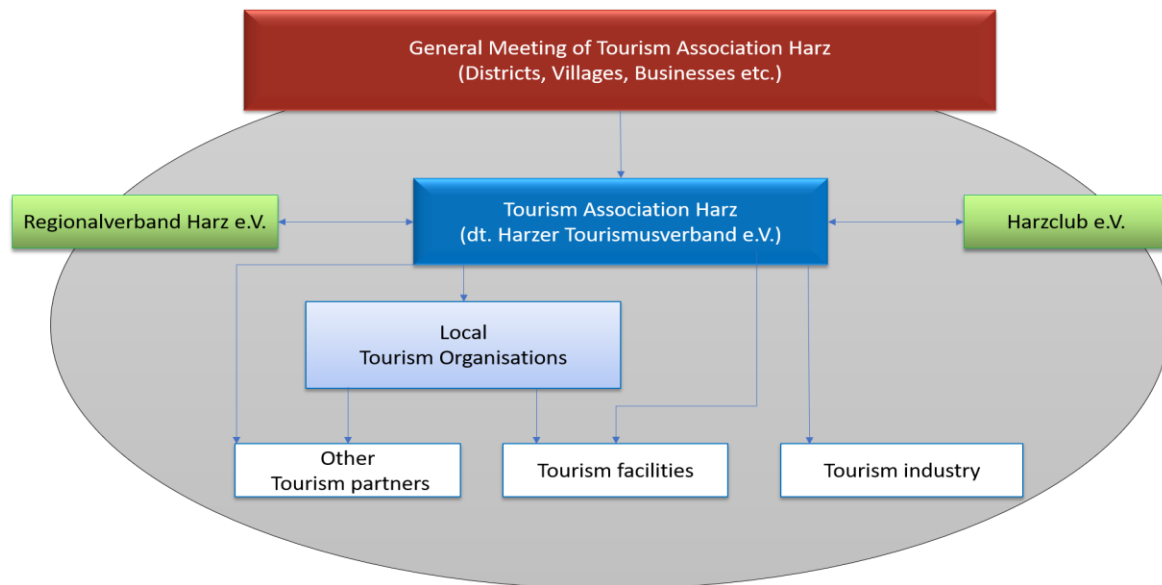


Figure 4a: Organisational Structure of Tourism in the Harz region (after HTV, 2016)

Furthermore, the functions and responsibilities for tourism development are dispersed between scales (Figure 4b). Individual businesses like accommodation and tourist attractions are responsible for the service, marketing and sales of their property. On a local level, tourism information centres market and sell locally. Beyond that, each district coordinates and markets its own tourism products. The Harz Tourism Association operates on a regional level and covers districts in three German counties. They are responsible for destination management, networking, destination marketing and branding of the destination to the outside. Internally, they help their partner businesses to position and market their products. Each of the levels is given autonomy within their field of expertise which makes cooperation especially important to bring across one message. The Vision 2025 is based wholly on the Harz destination. However, to implement those changes, cooperation between all levels is essential.

¹ <https://www.harzregion.de/de/regionalverband-harz.html>

² <https://harzklub.de/ueber-uns/>

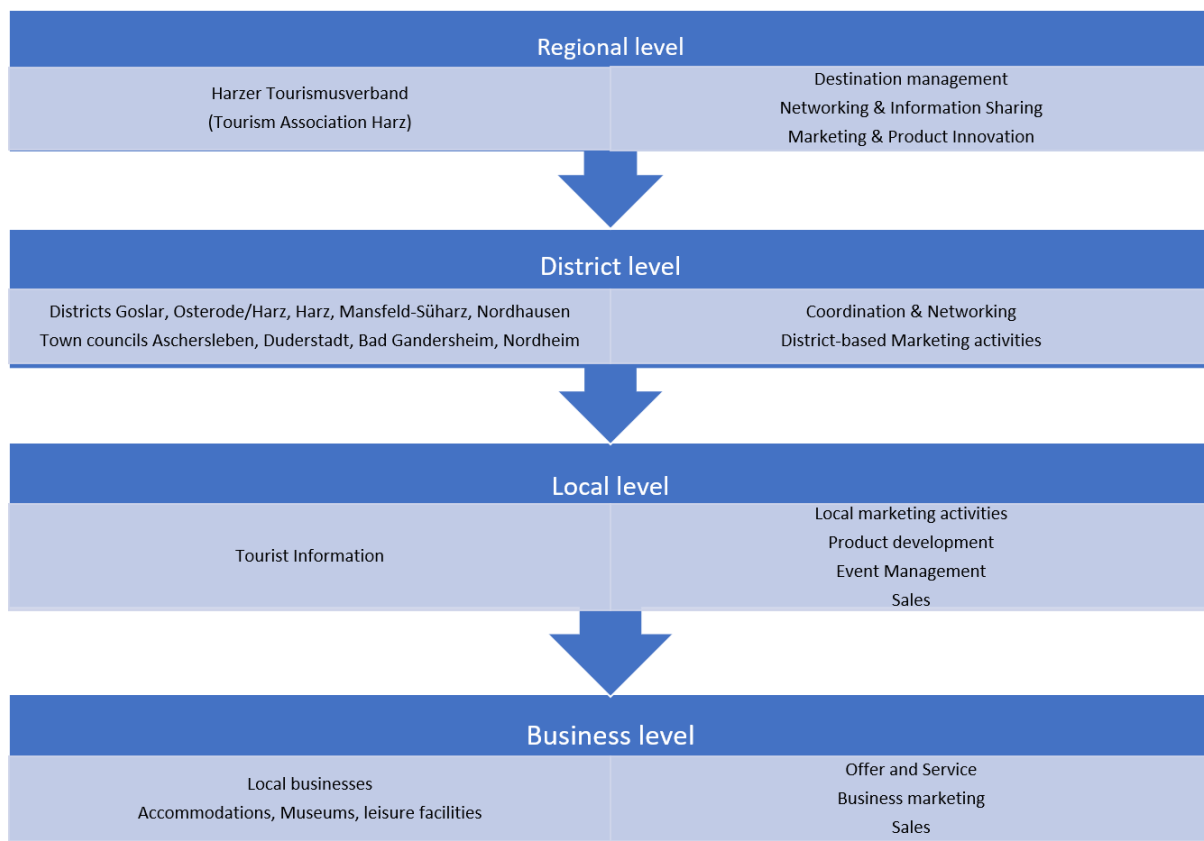


Figure 4b. Organisational Structure of levels and responsibilities (after HTV, 2016)

Key aspects in Vision Harz 2025

The vision's goal is to guide a sustainable and long-term competitive tourism development. It aims to achieve sustainable development by creating a stable industry and continuously improve current business practices. Due to an expected growth in tourists with a city escape motive and individual-tailored tourism activities the region expects a stable number of tourist arrivals. The vision builds upon the strengths of the tourism industry and suggests to further increase the product scope while paying special attention to those products independent of season or weather conditions. On the short term, snowmaking facilities should secure winter tourism. On the long term, the association aims to also attract international tourists.

Prerequisites for internationalisation, such as language skills, marketing in foreign languages and credit card acceptance that are only available in a limited scope and need to be expanded. To stay competitive, the region aims to implement more stable Wi-Fi hotspots and investments in online marketing. Furthermore, tourism hotspots should become more accessible by expanding the public transport offer, e.g. through long-distance buses.

Overall the vision presents great possibilities for tourism development, however, how those aims should be reached and in what way those actions match the target groups' interests is not specified. The vision is very much based on attracting a stable number of tourists in the upcoming years. This is to be reached by product development and increased accessibility. However, influences of outside factors such as competitors or environmental change are not considered. The vision makes the tourism association responsible for the coordination and communication about climate change adaptation and sustainability. Nonetheless, the developmental plan does not further elaborate on this topic and the business-as-usual approach does not incorporate active initiatives to adapt to a changing environment. It is to be determined how the envisioned sustainable development incorporates socio-ecological changes triggered by climate change, and how those changes affect the resilience of the Harz.

3.2 Research Design

The concept of destination resilience is relatively new to tourism research. In fact, conducting climate change research with the aim of consulting the tourism destination for resilience is a new way of applying the concept. Therefore, exploratory research with quantitative methods is used to investigate how climate change affects destination resilience. The case study design is chosen to analyse the phenomenon of today's climate change impacts on destination resilience in the Harz region. The Harz was chosen as a typical case study, representing an average low-mountain destination in Germany.

Previously, an extensive literature review was conducted, introducing the idea of resilient tourism and its importance in both tourism research and destination management. From a variety of models, Calgaro et al. (2014)'s 'Destination Sustainability Framework' was chosen as a framework for deductive research in exploring the Harz's resilience. It goes beyond the scope of this thesis to fully analyse each step proposed by the model. Instead, the model was used as a guideline in creating the somewhat less complex conceptual framework for this study (Figure 5).

The conceptual framework consists of four research steps, answering the two specific research questions and the general research question. The first step is the analysis of the Harz's exposure to climate change. Secondly and most extensively the Harz's sensitivity to climate change is analysed. To do so, imposed changes upon the economic, environmental, social and governmental tourism resources are looked at. Furthermore, tourism-specific sensitivities arising from impacts on the destination's core selling points are identified. Based on the findings of those first two research steps, the first specific research question can be answered. Within the next step, the Vision 2025 is evaluated based on its feasibility in adapting

the system to the changes imposed by climate change. Herewith, the second specific research question is answered. Based on those findings, recommendations for resilient tourism development are given to conclude this thesis. Hence, the conceptual model shows the connections between research questions and concepts and differentiates the research questions by the colours green and blue. The aim of this research is to contribute to improving destination resilience for climate change in the Harz region by analysing climate change impacts, destination vulnerabilities and possibilities to increase destination resilience.

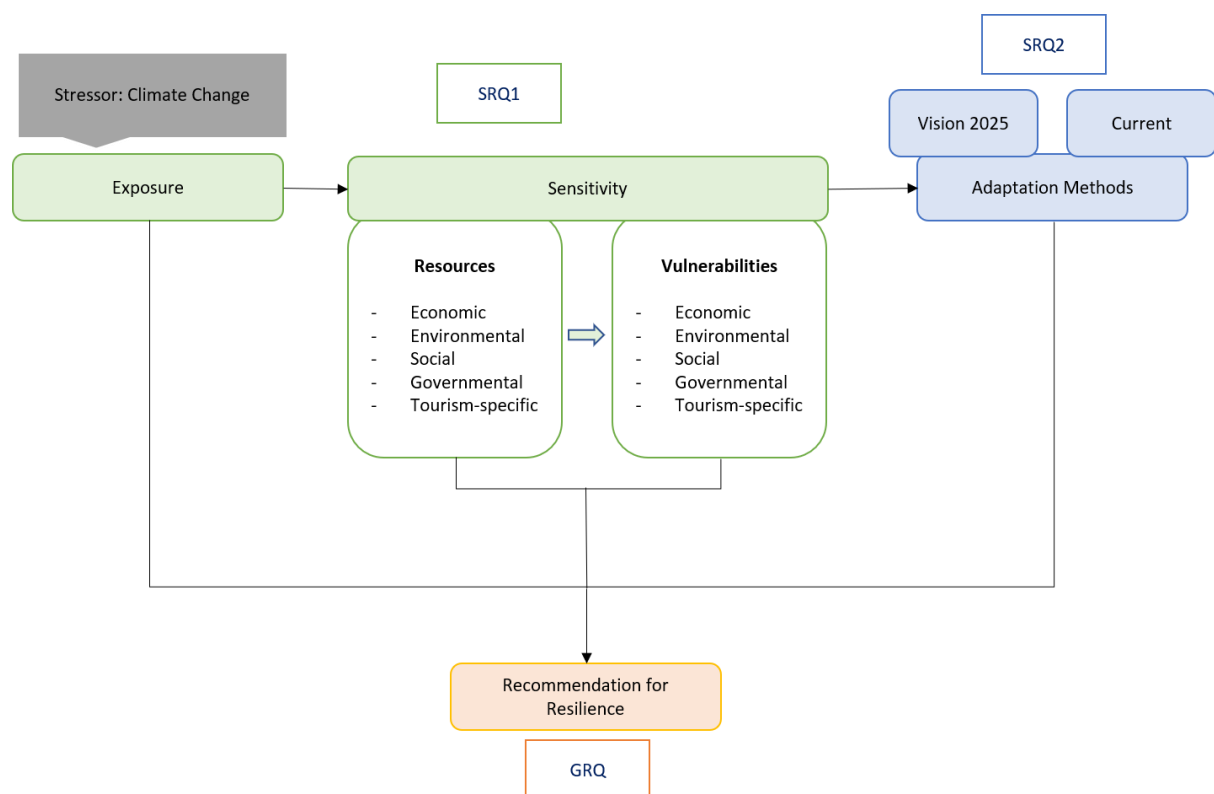


Figure 5. Conceptual Framework based on Calgaro et al. (2014)

3.3 Data Collection

A mixed-methods approach including big data, content analysis and interviews is used to answer the research questions. By using multiple data sources with information from different interest perspectives, an exhaustive understanding of the phenomenon is to be achieved. The specific research questions are answered based on both secondary data analysis and primary data from extensive interviews with key stakeholders in regional tourism planning.

Regarding secondary research methods, desk research was conducted. Several publications from research projects related to climate change in the region between 2008 and 2017 were collected. They were partly provided by one of the stakeholders and partly found by searching

for “Harz Tourismus” and “Harz Zukunft” on google.de. To ensure quality and correctness of information, only official publications from the ‘Harzer Tourismusverband’ and ‘National Park Harz e.V.’ as well as research institutes were considered. In a content analysis, all secondary data sources were analysed regarding information relevant to the study.

Regarding primary data, two extensive stakeholder interviews were conducted during the research period in May and June 2018. Time constraints of the researcher and limited availability of stakeholders narrowed the targeted sampling of local tourism managers to two interviewees. Key selection criteria for the targeted sampling was the stakeholder’s responsibility in tourism development and climate change adaptation. As an indicator for this, websites of local tourism organisations were used. Another important selection criteria were the difference in touristic interests and operating frameworks of the stakeholders. Multiple perspectives strengthen the research and prevent one-sided argumentation and recommendation making. The interview questions are based on Pyke et al. (2014) and Calgaro et al.’s (2014) methods in similar research projects (Appendix 1). In a semi-structured format, stakeholders were asked about their perspective on extreme weather events, risk management, climate change adaptation and tourism investment in the region. Beyond that, the stakeholders gave a deep insight into politics and power disperse at the destination which may be a barrier to sustainable development and destination resilience. The interviews were conducted and transcribed in German, while relevant information was translated into English by the researcher herself. Moreover, this research complies to ethic principles of research. All interviewees were asked to sign a code of conduct before sharing any information which keeps the interviewee’s identity anonymous. After agreement by the interviewee’s, the interviews were recorded for transcription purposes only.

3.4 Data Analysis

SRQ1. How vulnerable is the Harz Tourism System to the projected climate change-related shocks and stressors?

This question represents the foundation of the research. Defining the current status of destination resilience is the key prerequisite to investigating future scenarios. This question covers the concepts of exposure and sensitivity. Through content analysis, secondary and primary data sources are analysed, and relevant information extracted (Calgaro et al., 2014; Pyke et al., 2016). The exposure section primarily intends to present the impacts of climate on the region. The sensitivity section aims to draw upon features of the tourism system which are impacted by those exposures. It identifies economic, social, environmental, governmental and additional tourism-specific resources and features of the system (Calgaro et al., 2014), and

their sensitivities to the stressor. A detailed vulnerability analysis (Moreno & Becken, 2009) goes beyond the scope of this research. Therefore, possible vulnerabilities and drawn from destination sensitivities are summarized in a SWOT analysis (NOAA, 2011). The key strengths, weaknesses, opportunities and threats are used to draw attention to key vulnerabilities and possibilities of the region to face the imposed stress by climate change.

SRQ2: How compatible are the Harz's current tourism development goals with the projected climate change implications?

The first SRQ provided a detailed analysis of the local tourism system and its possible vulnerabilities to climate change. The second specific research question brings in the concept of system adaptiveness. To determine how well the tourism system is adapted to climate change implications, the current plans for tourism development (HTV, 2016) are compared to findings of destination exposure and sensitivities. Moreno & Becken's (2009) activity-hazard sub-system approach is used as a framework for those comparisons. It aims to 'tailor existing climate information to the specific needs of tourism stakeholders' (Moreno & Becken, 2009, p. 476). By doing so, matches and mismatches between the biophysical development and tourism development goals are determined. These are important findings as matches have the potential to be managed in a way that increases destination resilience while mismatches can threaten long-term sustainability.

4. Findings & Analysis

For the sake of this analysis, the findings from primary and secondary sources are combined to give a comprehensive overview of each concept within the research framework. As the research questions built upon each other creating a full picture, the analysis is structured after research concepts rather than research questions. Summaries about each research question are provided after the relevant sections. The next paragraph covers the analysis of climate change exposure on the Harz tourism system.

4.1 Exposure

In general, the climate in the Harz low-mountain area is defined as cold and humid. For the past years, changes in meteorological and climatic conditions have been observed. Local weather stations have measured an increase in average temperature of 1°C between 1990 and 2007 and it further increases since 2013 (Bastian, 2018). By the end of this century, the

average temperature is expected to increase up to 6.5°C (Kreilkamp et al., 2013). Between 2007 and 2010 also air humidity has increased by 10% (Bastian, 2018). Caused by a great increase in CO₂ emissions, the amount of acid rain has increased in the past decades (Knolle, 2016; Knolle, 2017). All in all, these changes were accompanied by a higher frequency of thunderstorms and heavy rainfalls which are hard to predict and have great destructive power (Bastian, 2018). Several researchers have also been looking into local ecological events related to climate change. Summarized, they come up with a list of eight place-specific features of climate change that the Harz region is exposed to (Figure 6).

Exposure of Climate Change on the Harz

1. Flooding (e.g. Pütz, 2008; Pinnow, 2008)
2. Little or no snow (Pütz, 2008)
3. Improved living conditions for bark beetles lead to monocultural forest decline (Pütz, 2008; Knolle, 2016; Kison, 2008)
4. Droughts and heavy winds threaten trees, especially European Spruce (Pütz, 2008)
5. Infrastructure destruction through more heavy storms and rainfall (Knolle, 2016)
6. Acid rain destroys flora and fauna (Adolphi, 2011)
7. Increasing danger of forest fires during dry season (Hofmann, 2010)
8. Extinction of local flora and fauna (e.g. Mauersegler and Brocken-Anemone, Pütz, 2008; Knolle, 2016)

Figure 6. Exposure of Climate Change on the Harz

In the future, local climate researchers expect an aggravation of the climate change impacts. On the one hand, the Harz is expected to have 53% fewer cold days (average temperature below 0°C) in 50 years from now (Pütz, 2008). This would lead to almost zero days with a natural snow layer of at least 10cm (Knolle, 2017). On the other hand, more than twice as many days will count 25°C and above while precipitation in summer will decrease by 20-30% (Pütz, 2008).

The Potsdam Institute for Climate Impact Research (PIK) estimates that the area will be naturally fully forested, suppressing alpine areas and high moors (PIK, 2015; Pütz, 2008). The climatic changes will also cause a dramatic change and shift in seasons (Pütz, 2008; Kreilkamp et al., 2013). Within a governmental research project on climate impacts and

adaptation research (KLIFF) in Lower Saxony (2009-2013), tourism climate scenarios for the Harz region were developed. In their “most realistic scenario 2071-2100”, experts forecast 14% more storms, 43% more rain days and 5°C temperature increase in winter while at the same time there will be 9% fewer storms, 43% less rain and an average temperature increase of 6.5°C in summer months (Kreilkamp et al., 2013).

Schünke (2008) indicates that 82.5% of tourism stakeholders interviewed already recognize unfavourable changes in tourism development due to climatic changes. Kreilkamp et al. (2013) predict the costs for damage repair, mitigation and adaptation will rise dramatically in the future. Additionally, the bark beetle population will be growing and water scarcity in summer will become a problem. This will lead to forest decline, especially of the common spruce (Kison, 2008), and loss of environmental attractiveness for tourism. How and to what extent those impacts threaten tourism’s operations and resources is covered in the next section, the destination’s sensitivity.

4.2 Sensitivity

Compared to other areas in Germany, the Harz is defined as being moderately vulnerable to climate change (Schröter et al., 2005; Pütz, 2008; Pinnow, 2014) meaning that its exposure is not expected to threaten the local environment to an extent that the threshold is reached. This categorization, however, should be handled with care. Although the pressure on the system as a whole might be limited, the pressure on individual industries such as tourism may be much higher. While snow tourism is classified as highly vulnerable across Germany, summer leisure activities are expected to grow as favourable weather and plant growth increase (Schröter et al., 2005).

Like proposed by Calgaro et al. (2014), the sensitivity context for the Harz region is determined in five perspectives namely economic, social, environmental, governance and tourism-specific sensitivities (Figure 7). A vulnerability is at place if tourism development builds upon context-bound resources which are highly impacted by climate change. In the following section is based on a content analysis of primary and secondary data sources and introduces the tourism contexts and its vulnerabilities to climate change.

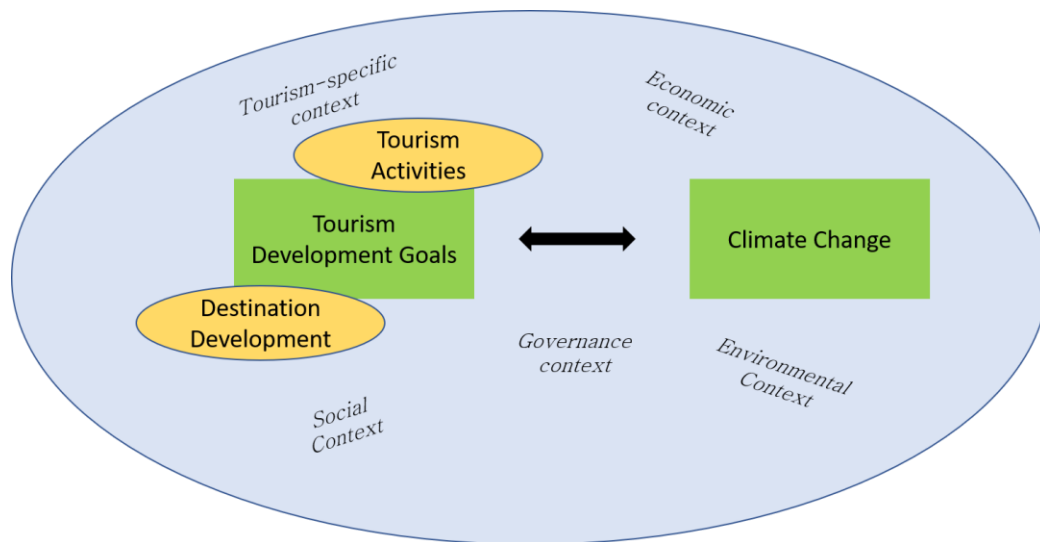


Figure 7. Harz Tourism System Context

4.2.1 Economic Context and Sensitivities

Tourism has been one of the key industries in the region for many years. Its importance for the local economy is indisputable. In 2014, tourism brought in about €157.4 Million tax revenues, which accounts for 6.8% of the local gross domestic product (GDP) per capita and lies therefore above the national average of 4.4% (HTV, 2016). The greatest income from tourism is generated in the accommodation sector with around €1.700 Million a year (HTV, 2016). With 55.580 beds at 843 accommodations (HTV, 2016) the supply is high, while the increase in over-night tourist stays is with 0.4% lower than the regional average (1.7%, Sparkassenverband Niedersachsen, 2017). This mismatch between tourism demand and supply is expensive to the industry. While a majority of 31% of tourists stay in a hotel, also vacation homes, B&B's, campgrounds and visiting friends and family (VFF) are widely-used. The accommodation structure gives all tourism groups and income levels an opportunity to stay in the region, the incentives to do so are though yet little (Interview 1). Due to its central location in Germany and in a 2h driving distance from major tourism markets, 27.5 Million day-trippers visit every year and spend on average only €23.50/day (HTV, 2016). This is €82.90/day less than an average hotel guest spends and limits the economic profitability of the region. Especially the service and retail industry profit from and depend on tourists' spending (HTV, 2016).

In fact, insecurity about snow conditions and the loss of environmental attractiveness of the region can lead to a shift from long-term bookings to short-term day trips, generating a great

tourism income loss and ability to plan continuous (Schünke, 2008). This would have several impacts on the tourism industry. With dropping snow reliability, winter tourism is expected to decrease (Interview 1). Accommodations currently depend on winter tourism to keep running their business (Schünke, 2008). Additionally, increasing frequency of extreme weather events will increase costs for maintenance of their property. Under these conditions, the low amounts of capital surplus may not be sufficient anymore to keep up business (Schünke, 2008). Insufficient quality of accommodation as a retreat for weather-dependent activities is greatly impacting tourist's perceived holiday security and willingness to choose for the region. The low local capital to innovate within the whole region makes it dependent on external sponsors or governmental initiatives (Pinnow, 2014), especially if tourism development demands additional investments.

Next to increasing insecurity about tourist numbers, climate change increases costs for maintenance, damage repair, mitigation and adaptation, which makes tourism businesses dependent to a greater extent on higher tourists spending and external investments (McGinnis, 2016; Scott et al., 2012). Regarding that, KLIFF experts draw attention on waiting too long with adaptation as "the more the climate changes, the less able to adapt the tourism becomes and the higher the costs for adaptation will be" (Kreilkamp et al., 2013, p.31; Interview 1). Economic success, therefore, depends on smart decision making which projects both the tourist's travel choices and tourism resource availability after climate change impacts. Not covering all factors can lead to poor planning and unsuccessful investment.

4.2.2 Environmental Context and Sensitivities

The environmental context of the Harz tourism system consists of its environmental responsibility, transport infrastructure, natural resources and resource competition between industries (Calgaro et al., 2014). Environmental and geological resources are the key resources for tourism in the region. Developmental initiatives built upon those to offer environmentally responsible tourism. Climate change directly impacts those natural assets and vulnerabilities arise whenever destination development does not mitigate those changes.

Environmentally, the Harz region aims at climate adaptation, raising awareness on climate-consciousness towards tourists to create a climate-friendly destination (HTV, 2016). In this way, the region can move from a tourism destination towards a place for educational experience and positions itself in contrast to the city life a great share of the target group wants to escape from. A region as threatened by climate change as the Harz would be the first people expect reacting to it (Kreilkamp et al., 2013). With increasing appearance of climate change

impacts and non-adaptiveness, a mismatch between tourist's expectation of responsibility and actions can impulse a negative image and threaten the destination substantially. In fact, the structure of the ongoing tourism system stays in contrast to those environmental responsible aims.

The region is centrally located in Germany, contributing to a high influx of tourist numbers from major cities. In terms of infrastructure, tourist arrivals by car account for 74% while public transport is only used by 22% of tourists. These numbers reflect on its good accessibility by car and underline the great connectivity to national highways. However, high car accessibility threatens the environmentally friendly image the HTV aims for. Kreilkamp et al. (2013) criticize that the public transport system is not adapted to day trippers who threaten the environmental carrying capacity through traffic congestion and air pollution (HTV, 2016). Improving the local and regional public transport is yet continuously on the agenda of tourism planners (HTV, 2016; Interview 1). In December 2017, the local bus operator ÖPNV passed a new system after two years of preparation. It includes more frequent bus services (every hour or every second hour), a more integrated ticketing system and more connection between districts³. With the HATIX card, overnight guests can use public transport for free. The new system can help to make the Harz Tourism Industry more environmentally friendly and less dependent on cars, however, the HTV warns that the connectivity and frequency may not be enough to be a better alternative to individual transport modes, especially for day-trippers (HTV, 2016). Before defining methods to change environmental unfriendly behaviour by tourists, their decision-making process needs to be understood. Giving tourist's interests a central role in sustainability actions is of great importance to decrease vulnerabilities arising by supply-demand mismatches.

Another factor of attention is the vulnerability of natural assets. Considering their importance for the tourism market, unmanaged imposed changes can become a problem to destination resilience. Diverse landscapes and activities create a unique portfolio for the region connecting culture, nature and sports. For 95.8% of all visitor's relaxation in nature is the main travel motive (HTV, 2016) and overall satisfaction with nature-based tourism offer is higher (Kreilkamp et al., 2013). While the demand for nature tourism is increasing, the Harz needs to protect its main pull factor. The tourism industry is highly dependent on its natural assets while being ecologically sensitive and hazard-prone. This draws a great vulnerability to the region (Calgaro et al., 2014). Especially deforested areas and damages through bark beetles disrupt

³ <https://www.mz-web.de/landkreis-harz/nahverkehr-im-harz-300-000-kilometer-mehr-pro-jahr-28760046>

the nature enjoyment (Kreilkamp et al., 2013). On the other hand, the moderate climate with increasing temperatures is expected to generate more mixed forest which is considered a more attractive landscape by tourists (Kreilkamp et al., 2013).

Lastly, the increasing competition for resources between stakeholder is also an environmental problem. Due to climate change, resources such as water and fertile land will become more scarce and competition will further increase the risk of resource-overuse (Interview 1; Schünke, 2008). Tourism depends on the natural sceneries of agricultural lands (Kreilkamp et al., 2013). However, the agricultural sector will need to modify its products to stay competitive which may lead to a less attractive landscape for tourists. Furthermore, the attractiveness of the forested areas is in competition between forestry and tourism scenery. While certain tree species and monocultural orientation are more efficient for the forestry industry, tourism attractiveness increases with mixed forests (Kreilkamp et al., 2013). Forest management can be expected to become a more contested issue in the region than it is today. Lastly, prospected water scarcity increases local resource competition and challenges especially water-intensive tourism products such as golfing and snowmaking facilities (Kreilkamp et al., 2013).

4.2.3 Social Context and Sensitivities

The social context of the tourism market considers the condition of both the local populations and potential tourist group. Both groups have their characteristics and challenges which increase if climate change adaptation is postponed. The region has shown decreasing population of up to 24% over the past 20 years. While 7% of locals work in the tourism industry, a great share of them has a low income (Kreilkamp et al., 2013). There is a lack of well-educated and flexible employees. This drawback is currently compensated with the high motivation employees have for their jobs. However, to secure long-term business both need to match. The region aims to increase the attractiveness of local tourism jobs through higher incomes and flexible working hours (HTV, 2016). It is evident that if the region does not find sufficient trained staff, the quality of the destination regarding both tourist attractiveness and quality of life for locals will decrease. Future tourism development depends on sufficient qualified staff to achieve a stable increase in tourism quality and extraordinary tourism experiences. At the same time, the tourism industry depends on an increasing benefit to stay competitive while costs increase due to climate change. Alternatives to the snow-based winter tourism are needed to keep up the business (Pinnow, 2014).

Social changes in tourist generating markets increase the environmentally friendly development of the region. The awareness of climate change and environmental consciousness is increasing among tourists and reflects in tourist demand and behaviour. It is expected that more tourists demand climate-friendly holidays in a nature-based destination as environmental friendly behaviour will be associated with a higher quality of life. Furthermore, society becomes increasingly mobile with flexible working hours and increasing income spend on leisure activities. The frequency of short trips increases. Urbanisation leads to an increasing travel motive for nature-based destination and can increase tourism demand for the region (Kreilkamp et al., 2016).

If the region adapts to those changing conditions, those changes become opportunities rather than threats. The local tourism managers are aware of those changes and show the willingness to adapt (HTV, 2016; Interview 2). However, changes in tourism demand are not only a social phenomenon, but also create vast impacts on the constitution and characteristics of the tourism system, which the next section will draw upon.

4.2.4 Tourism-Specific Destination Characteristics and Sensitivities

Beyond the impacts on tourism's economic, environmental and social resources, the tourism system is also impacted directly in its selling point. The mountain setting is unique in the geographical area. Natural resources are combined with an extensive hiking network, observatories for wild animals and history of myths of fairy tales. In an inimitable combination of historic cities, the area creates a unique selling point (Schünke, 2008). Product diversification is generally high due to local competition. The variety tourism resources combining natural assets, UNESCO world heritage towns and German history offers a scope of tourism resources to draw from uniqueness factors such as historic transport modes increase the competitive advantages towards other destinations. A diverse tourism offers using different resources for different activities makes the destination is relatively stable against fluctuating travel choices and temporary unavailability of specific activities. Not having a single main attraction decreases the vulnerability of the region by sharing the risk among many parties. However, for a resilient destination, diverse attraction is at least as important as diverse tourist groups. The region holds an image of being secure and clean, as well as boring, conservative and old. The major target group attracted are seniors which is an increasing market. However, local stakeholders aim to attract a more diverse tourist group to better secure competitiveness and long-term demand (Interview 2). Marketing activities towards a variety of target groups are not yet accomplished (Interview 1).

Regarding business flexibility, the low amount of local capital along with business-as-usual approach hinders adaptation. Increasing insecurity about the weather conditions and decreasing snow reliability put pressure on older accommodations to renovate and offer tourists more than a bed to sleep in (Pinnow, 2014; Kreilkamp et al., 2013). This is becoming especially important in winter, where amenities functions as a cushion for snow tourists in case of snow scarcity.

While extreme weather events aggravate tourism activities, a summer with better weather conditions, longer seasons and refreshing climate can increase tourism attractiveness (Kreilkamp et al., 2013). Based on a tourist survey conducted in 2010/2011 Kreilkamp et al. (2012) show that in every season, weather-dependent outdoor activities are the main pull factor. Only between 3 - 6% of tourists are pulled by cultural events. When asked which activities tourists follow at the destination, a great majority of winter (78%) and autumn (92%) tourists go hiking. The second most popular activity is indoor swimming (17%). Other activities are visiting holiday parks and animal parks (Kreilkamp et al., 2012). About 55% of tourists consider the weather as being unsettled. In case of bad weather, tourists show an interest in cultural alternatives. In spring, summer and autumn about 65% would consider those, in winter only 11% showed an interest in indoor alternatives. When selecting an alternative to winter sport in case of insufficient snow, over 70% of tourists would go hiking instead. Furthermore, 34% of tourists would enjoy a wellness program instead. Other activities mentioned are horseback riding, outdoor sports and cycling. When asked about their opinion about climate change implications, tourists recognized that it will have a great influence and is shown especially through temperature rise, storms and heavy rain. In fact, 67% of tourists want tourism operators to minimise their contribution to climate change, 29% like to be offered alternatives during rainy weather and more than 90% are against artificial snow production as climate change adaptation method.

On an institutional basis, the tourism industry faces challenges due to the high number of stakeholders with a limited interest in co-operation (Interview 1). Unwillingness to cooperate also limits the institutional flexibility to adapt to a more climate-friendly and sustainable tourism (Kreilkamp et al., 2014; Calgaro et al., 2014). In general, there is not yet a destination-wide master plan for tourism disaster preparedness or mitigation, while other sectors such as the firefighters and government have adapted their action plans after recent storms and floods (Interview 1 & 2). Currently, most climate change-related actions are focused on maintenance rather than provenience. Some stakeholders are adaptation advocates and strongly advise to introduce comprehensive adaptation measures to decrease economic costs (Interview 1). Others perceive cooperation as limiting the economic benefit of tourism (Schünke, 2008).

4.2.5 Governance Context and Sensitivities

Governance processes can support or hinder resilient behaviour (Calgaro et al., 2014). The structure of tourism governance in the area is multileveled and complex with partly overlapping responsibilities (HTV, 2016). Also, climate change adaptation plans are made on a local, regional and national level (Interview 1). Without considering the tourism system, governmental actors try to match those adaptation plans. Mismatches between governmental actors and tourism management become evident in the example of the Vision 2025. Although it was created three years after the governmental climate-research project has been completed (Kreilkamp et al., 2013), it does not seem to consider its warnings or adaptation advice. It also becomes evident that the perspective on local conditions differs between governmental actors and locals. In fact, where climate adaptation and tourism overlap individual tourism stakeholders impact the regulations in their interest (Interview 1 & 2). Politics, lobby pressure, trust issues and unwillingness to cooperate are yet the main barrier for sustainable and resilient development in the region (Interview 1). In fact, some stakeholders believe that developmental concepts are written under high lobby pressure and adjusted to better suit investment projects, regardless of the facts (Interview 1 & 2). It is argued that this has been the case with the development of the ski area in the village Schierke. To put the plan into practice, a statement about not investing further into winter tourism was deleted from a governmental concept paper (Interview 1).

Tourism managers criticize that some local tourism operators make deals with wealthy investors which contradict the tourism development goals (Interview 1 & Interview 2). The development plans are not supported enough with a financial budget which cold out-rule those investments (Interview 2). The region is highly dependent on external investments which pushes the tourism association to adapt their plans in so far, that governmental sponsoring for implementation of climate adaption methods is received (Kreilkamp et al., 2013). Bureaucracy and the complexity of the issue increase preparation, implementation and resilience building time spans which require early action and long-term actions. Early plans for adaptation matters can decrease vulnerability and increase destination resilience (Kreilkamp et al., 2013; Schünke, 2008).

4.3 Harz Destination Resilience - Summary

The Harz' destination resilience is defined by the current situation and the opportunities the system takes to react to the climate impacts. In order to answer the first research question of

how vulnerable the Harz tourism system is to climate change, strengths, weaknesses, opportunities and threats are summarized in a SWOT analysis (Table 1). It becomes clear that the system features many strengths making the system resilient to outside stress. The diverse offer and target group create a tourism industry resilient to make changes. Looking at climate change impacts, however, weaknesses arise. Little alternatives to snow tourism in winter, low quality of accommodations and few financial assets are only some of the examples which become threats when costs for maintenance explode. Trust issues, stakeholder competition and investments based on the lobby rather than development plans hinder cooperation and threaten resilience. In fact, climate change gives the region many opportunities to increase demand, governmental subsidies and decrease competitiveness. An integrated destination management could build resilience by integrating climate change implications in overall development goals. How well the region is going to react upon those changes will determine its future resilience. To what extent current plans in tourism development influence destination resilience will be discussed in the next section, system adaptiveness.

Table 1. SWOT Analysis – Harz Destination Resilience

Strengths	Weaknesses
<ul style="list-style-type: none"> • Diverse tourism offers • Unique destination assets • Established destination • Diverse target groups (families, seniors, active tourists, wellness tourists) • Motivated staff 	<ul style="list-style-type: none"> • No coherent offers or branding strategies • Few financial assets • Low-quality accommodations • Stakeholder competition • High traffic & car dependency • Little alternatives to snow tourism in winter • Lobbying creates trust issues • Investments made outside the development plan • No Tourism emergency plan
Opportunities	Threats
<ul style="list-style-type: none"> • Increasing tourism demand (escape motive, seniors) • climate-friendly destination through extension of public transport network • subsidies for climate change adaptation • integrated destination management by DMO 	<ul style="list-style-type: none"> • forest deuteriation through plague • increasing competition for resources • increasing maintenance costs • increasing pollution with increasing tourist numbers • shift towards day-tripping

4.4 System Adaptiveness – Vision 2025: From Vulnerabilities to Adaptation measures

Diverse vulnerabilities created by climate change impacts on the tourism system were mentioned above. To adapt the Harz tourism system to new dynamics and prospected changes, short-term responses to extreme weather events as well as long-term adaptation methods regarding preparation for the accumulating impacts of climate change are needed. The Vision 2025 guidelines a variety of action points (Interview 2, HTV, 2016). It includes several planned actions towards long-term tourism development, however evaluating those based on climate change impacts is not yet defined. In order to define how effective the tourism system is in responding to climate change, it needs to be determined to what extent those planned actions respond to the destinations vulnerabilities, minimize them, use them to build resilience or increase them.

There is no doubt that the tourism development goals and the climate change implications influence each other. This can be direct, for example, snow scarcity pushes the winter sport tourism towards its threshold, but it can also be indirect by implicating the economic, environmental, social, touristic and governmental context in which tourism is practised. In the previous sections, climate change implications and tourism resources were determined. That information serves as background for determining matches and mismatches between development goals and vulnerabilities caused by climate change after the model of Moreno & Becken (2009). Initially, the Vision 2025 is summarized in its key action points.

4.4.1 Tourism Development Goals

In the vision Harz 2025, eight key actions in tourism development are mentioned which aim to give a framework to all developmental actions. Those actions are:

- Define Tourism activities with high pull-factor
- Activities independent of weather conditions
- Sustainable tourism to increase the quality of life
- Tourism for everybody including the Disabled
- Innovation
- Increase in quality standards
- Accumulation of set-aside financial budget
- International Orientation.

Next to those guiding goals, other ideas for destination development are planned for. The destination accessibility is aimed to be improved through investment into public transport, e-mobility and tourism infrastructure meeting special needs from seniors or disabled guests. Image marketing as one region is to be strengthened whereas digitalisation is to be increased. Furthermore, the organisational structure of tourism management is to be simplified and cross-cutting responsibilities to be eliminated for stronger leadership and management. More qualified employees are to be educated and frequent training should increase the quality of service. Who is responsible for those actions and how its success is to be determined is not included in the vision paper.

Beyond the general aims of the vision, specific key tourism activities are to be developed (Table 2). In most cases, those planned actions are concerned with the maintenance of the activity-dependent infrastructure. However, unique cultural experiences are to be added to the tourism offerings. It is striking that all actions are small-scale and short-term. For instance, more frequent maintenance practices at hiking trails do not require extensive analysis or planning, but rather a higher budget for maintenance employees and practices. The same applied to plans in increasing the attractiveness of built environment, accommodations and cultural tourism. Maintenance is a crucial part of any business which becomes increasingly important when structures become more vulnerable, which is the case through climate change. However, simply maintaining what is there has little to do with visioning or resilience building. More long-term oriented are infrastructural changes such as the expansion of parking areas, cycling trails or water sports. Due to its high investment and longevity, sustainable informed planning is of high importance. Considering the longer life cycle of those investments changed implicated by outside factors such as climate change becomes of utmost relevance.

Table 2. Vision 2025 – Planned Actions

Activity	Planned Actions
Hiking and Mountain biking Trails	More frequent maintenance practices, also through the establishment of new local organizations
Cycling	Expand Infrastructure to increase demand
Parking Areas	Increase number of parking spots to supply demand sufficiently
Signage	More frequently update sign throughout the region and add signing system for cars and pedestrians
Attractiveness of built environment	Increase attractiveness through maintenance and greening
Accommodation	Modernize, expand and better match offer to demand

Winter Tourism	Expand artificial snow production and jointly manage skiing regions to increase efficiency
Water Sports	Create infrastructure for water sports
Cultural Tourism	Maintain and secure cultural offers through financial investment, innovation, education
Unique Cultural Events	Design and create unique cultural experiences
Health Tourism	Marketing and Diversification

4.4.2 Development Goals and Resilience: Matches and Mismatches

The key attention points in the development goals can be analysed based on its feasibility considering climate change impacts. Ten of the goals were found to be either well adapted to or strikingly critical considering climate change implications.

Matches

1. Accumulation of set-aside financial budget. This is an important key factor for destination resilience to hazards, however, it needs to be ensured that it does not limit innovation and mitigation practices.
2. Image marketing and digitalisation. Digitalisation is increasingly indispensable to stay competitive.
3. Simplify organisational structure to create leadership & DMO. Considering the stakeholder competitions at the moment, this is probably the most important step towards managing the destination sustainably and towards resilience. The benefits of creating a local DMO are many, the challenges to doing so too.
4. Cycling trails and water sports. These plans diversify the tourism offer in the extended summer season and make the industry, therefore, more resilient. Watersports feasibility may be restricted through water scarcity.
5. Weather independent activities & increased quality of the offer. This response reacts to the insecurity of weather conditions and is of great need to secure tourism in the long-term.
6. Maintenance of outside trails. Due to the great ecological changes, maintenance becomes more needed and costly. However, it is of utmost importance to secure tourism's key resource.

Mismatches

7. Expand parking areas. This plan contradicts with the climate-friendly image the region aims to achieve and stays in conflict with the expansion of local public (e.g. ÖPNV) infrastructure.
8. Snowmaking facilities. Those can only generate short-term benefits as its prerequisites of -5 degrees are met little and the 100-day-rule for winter sport destinations (minimum ski days to be economical feasibility) is often not met, besides snowmaking.
9. International Orientation. This can be seen critically as there is much investment needed to enable large-scale international tourism (e.g. translation, marketing, accessibility). As domestic tourism numbers are expected to increase, this investment may not be of utmost importance.
10. Improve Quality of Accommodations. The improvement builds upon the maintenance of current infrastructure. Maintenance is costly and will become more frequent when the number of extreme weather events increases. If the envisioned future depends on high-quality accommodations, but the costs are not affordable for accommodation owners, the region becomes vulnerable.

Summary

The analysis shows that there are matches as well as mismatches between prospected climate change implications and developmental goals. System adaptiveness, however, does not only require anticipation in the tourism business, but also acknowledgement of long-lasting feedback loops, the capacity to learn and critical intervention for future resilience (Calgaro et al., 2014). Therefore, the threat to destination resilience is an overall lack of a long-term systematic view and inclusion of adaptation in planning. Climate change increases the vulnerabilities and potential threats the destination has as of this lack. In the following, the discussion will discuss those fundamental threats to resilient destination development.

5. Discussion

The past chapters have introduced the Harz tourism system, its characteristics and vulnerabilities to the changes climate change imposes on tourism practices. Eventually, matches and mismatches between current tourism development goals and those changes were made. It was defined that the Harz is medium vulnerable to climate change and based

on its diverse offer quite resilient to market changes. However, destination managerial deficits, stakeholder competition and trust issues weaken the ability to respond to threats and changes. Business-as-usual is the easy way out but can not be considered a long-term solution for resilient development. So how can the Harz resilience be improved?

The tourism industry is diverse and complex. To secure a successful sustainable long-term offer, all these actions add to the system like puzzle pieces. Being interrelated in many ways, all actions have an impact on several factors within the tourism system. Through feedback loops, they have the power to impact sensibility towards the climate change stressors. Every action can mitigate and decrease the destination's vulnerability in a specific factor, however, can also simultaneously increase it for another sector up until it reaches a threshold and changes the system. Understanding these dynamics is important in making the Harz tourism system more resilient. If the vulnerabilities are considered a fact and the dynamics stay unattended, the tourism system risks reaching an unfavourable threshold with vast consequences. It is not sufficient to see the mismatches between development goals and climate change implications as an activity to avoid. The fact that those mismatches arise indicate a greater gap on managerial basis. Both the outcome of this analysis as well as recommendations from other research papers draw towards ideas for system adaptation.

The findings suggest five reoccurring weaknesses in the tourism system which threaten destination resilience on the long-term. Stakeholder networking is yet limited, the dynamics in tourism demand underestimated, the recognition of climate change threat contested, power and politics create distrust and allow for contradictory projects, and opinions about financial investment and costs are various. In the following, those six aspects are discussed and recommendations for the destination drawn upon.

5.1 Collective Management and Networking

Some scholars argue that collective management is crucial for effective planning for resilience (Orchiston et al., 2016; Becken, 2013). Cooperation between stakeholders is yet low and its importance for the destination underestimated as stakeholder interviews show (Interview 1 & 2). Regarding climate change adaptation, networking can be a possibility to decrease cost and threats by sharing the risk and create a greater pool of adaptation possibilities. Furthermore, a well-developed network can facilitate tourism quality (Schünke, 2008) and an increase in the financial benefit of tourism as connected offers can increase the length of stay (Schünke, 2008).

Nowadays, the HTV cooperates with many individual businesses for marketing and information sharing purposes. Through the creation of a vision, stakeholders create a joint document for guidance which is followed voluntarily but not strictly implemented (Interview 2). The vision only concentrates on tourism activities. Therefore, to develop towards a resilient destination, this vision needs to become more integrated into seeing the bigger picture of regional development including job creation and eliminating isolated actions by individual stakeholders. In fact, due to cooperation, the destination can become stronger than the sum of its parts. Established networks, as well as trust between stakeholders, can decrease the impact of lobbies determining the region's future. Kreilkamp et al (2013) advice to strengthen the position of the HTV beyond convener towards network leader by increasing its functional importance and responsibility for the region. A cooperation between the HTV and the association of the biggest tourist attractions in the region can facilitate this change (Interview 2). The organisation yet sees themselves as lobbying the region. There is no doubt that initiating a combination climate adaption for economic benefit and increasing tourism numbers can be expected to be the most attractive solution (Kreilkamp et al., 2013).

Next to stakeholder cooperation, also the willingness and ability to cooperate between researching and managing parties within the region are low. To facilitate understanding in complexity terms of the system, as improving quality of decision making, adaptive governance approaches in cooperation with researchers can be implemented. However, if there is no critical need recognized by tourism managers, business-as-usual will remain. Unawareness, for example through positive experiences in the past create a key vulnerability to the region (Espiner & Becken, 2014). Given its multi-layered organisational structure, the tourism management is directly in contact with tourists. Through efficient feedback loops between the layers, enables quick response to market changes and integrated planning.

5.2 Dynamics in Tourism Demand

Overall, the tourism management does not expect any changes in tourism demand due to climate change (Interview 1& 2), while researchers found that most tourists expect the region to operate in a more climate-friendly matter (Kreilkamp et al, 2013). To what extent those beliefs will influence the image and tourism demand is yet to be seen. What's presently evident is that storms and increasing bark beetle populations will cause great forest destruction. Although some tourists understand the natural processes causing this loss, the environmental aesthetic of the great forests is lost and seen as a burden to the holiday experience (Interview 1, Kreilkamp et al, 2012). Beyond the responding to the demand, more climate-friendly tourism

products can improve destination image and marketing. Enabled through stakeholder networks, environmentally friendly tourism products and transportation modes may improve destination profiling and decrease the dependence on winter tourism (Franz, 2003).

5.3 Recognition of Climate Change Threat

Recognizing a threat through climate change is the first step to be able to adapt as adaptation takes place as a response to perceived risk and opportunities (Pelling, 2011). Currently, managing parties do not recognize a controllable risk while opinion about the need for adaptation differs (Interview 1& 2). In the Vision 2025, the HTV is announced responsible for information sharing about climate change adaptation and destination sustainability (HTV, 2014). However, primary research showed that generally businesses are made responsible for adapting in their own economic interest (Interview 2). In fact, all resilience methods currently implemented are about resilient adaptation not planned resilience. This creates a vulnerability as infrastructural investments are long-term and adapting investments may be untimely allocated to prevent a threshold being reached (Interview 1; Orchiston et al., 2016). In fact, sustainable development is understood as 'adapting if needed' by many of the stakeholders (Interview 2). This understanding differs from the concepts meaning in academic literature (Wageseil & Zemp, 2016; Espiner et al., 2017) and produces a great threat to sustainable and resilient destination development.

Despite the facts, tourism managers see climate change as a change in the world having not more impact on the region than everywhere else. They expect tourists coming from neighbouring areas to be aware of those changes and accept to go with them. Climate change implications are not recognized as an incremental threat to the region by managing parties (Interview 2; Espiner & Becken, 2014). In fact, the impact of floods and storms in the past years have impacted the regional heavily. The reparation of some popular hiking trails took up a few months. In the eyes of some stakeholders, however, this is seen as a burden to work with, in the hope that those heavy meteorological incidents do not occur too often (Interview 2). It is evident, that the frequency and destructive power of storms have increased and further will in the coming years (Knolle, 2016). There may not be a simple solution to sudden weather events, however, the tourism managers do not think beyond the activity impacted. This prevents them to recognize adaptation methods on a destination-wide level, such as alternative offers. In the coming years, climate change will further increase the cost burden and limit the flexibility of business towards the threshold of bankruptcy. Those effects can be mitigated if the region expands their adaptation efforts further towards preparational planned adaption methods (Orchiston et al, 2016). One of those foreseen adaptation plans well discussed amongst stakeholder in the region is snow tourism. While some stakeholders

believe in many more years of winter tourism with artificial snow production, others see it as a nice addition to the winter offer if possible, and a third group asks to stop investment into winter tourism immediately. The income generated on snow days is a great share of the annual income as the Harz is the only traditional winter sport destination in the area. The facts show that the amount of snow is very unstable over the years and if the destination misses investing into alternatives with pull-factor, the destination will shift from a year-round destination to a summer destination with great impacts on the industry and livelihoods (Becken, 2013).

5.4 Power and Politics

Although the willingness of stakeholders to worry about climate change is low (Interview 1 & 2), the region does show features creating destination resilience and opportunities for the region. The sizeable market for winter tourism and the diverse offer combining nature, culture and historic attractions in summer create a competitive advantage. This competitive advantage, however, is influenced by actors' behaviour within the system. As all actions can directly impact the stability and resilience of the system, investments outside the development framework threatened destination resilience (Walker et al, 2004). Resilience demands the ability and willingness to read signals early. This willingness varies between conservationist actors and some business managers, who do not want to think about climate change implications and see conservationists as "people who want to turn the clock backwards" (Interview 2). The distrust and misunderstanding of goals hinder resilience. In fact, the Harz tourism is vulnerable to hazards and limited disaster preparedness as no tourism emergency plan exists and a communication plan is not set. Nonetheless, the population depends on tourism as an economic tool, as high emigration rates show. Further, resilience measures need to approach both people and the destination which is supported by a year-round tourism (Becken, 2013). All in all, through system learning, resilience can be planned for as well as the reaction to natural hazards made fast and efficient (Orchiston et al., 2016). This is yet prevented by some stakeholders who think of forecasting as a waste of money and time, while finances are scarce. The economic interest behind forecasting is not yet recognized by all stakeholders responsible for destination management.

5.5 Investment

Beyond missing networks for adaptation, limited financial assets hinder the implementation of a joint initiative. It is at hand, that if the region is able to create and support its own development plan on all governance levels, it can better face external investors and evaluate new investments more efficiently. In fact, this would decrease negative impacts of those long-term

investments which are not applicable to destination goals. Due to a neo-liberal approach to destination management, the German and European government allocates funds and autonomy in decision making to the region (Lew et al., 2017). Yet however, complex guidelines and missing leadership impede smart investments for the benefit of the region as a whole (Interview 1).

Planning for resilience requires capital investment and business flexibility (Calgaro et al, 2014). Those are limited by destination-internal competitions and missing leadership towards the new approach of tourism development. Yet projects initiated by different actors within the network contradict. This is, for example, the case regarding transport modes. Some stakeholders invest in expanding parking areas for tourists as the car is the main mode of travel (Interview 2). Others engage in contracts with public transport providers to make the region more accessible in an environmentally friendly way and decrease air pollution (Interview 1). There is nothing wrong with letting the tourist choose for their preferred way of travelling, however, being internally contested, also external investments support individual actions and work against collaborative approaches to destination management. The destination does not have the financial power to go against big investors. Some stakeholders do not trust their vision enough to refrain investors from implementing their mismatching idea (Interview 2), while others accuse individual stakeholders to initiate fake expert opinions to receive governmental funds making those projects possible at the first place (Interview 1). Contestation and dependence on external funds create competition and decrease destination resilience (Calgaro et al, 2014).

If a resilient destination should be improved, networking goes along with structural changes in the tourism system (Pelling, 2011). The region needs to increase its direct income from tourism to balance the increasing costs for maintenance and resilience building. The maintenance of trails and attractions should become key to developmental actions. Investments should be made, not only for repair but also renewal and decrease vulnerability to climate change threats. A greater destination income and business flexibility can help attract employees and work against emigration. The development goes hand in hand. A clear tourism vision can raise tourism income which means better-paid jobs, which makes the destination an attractive place to live and stay during holidays. Hence, people feel safe and well-off, being more willing to think outside the box and can motivate to develop the region further (Sheppard & Williams, 2016). Overall the discussion gives insights into what can be improved. However, those recommendations are based on a limited research scope as the next section discusses.

5.6 Limitations

The research contains several limitations which are considered and, if possible, mitigated by the researcher. The study design includes a reduced version of Calgaro et al.'s (2014) model which may be considered a threat to the research's integrity and internal validity. The extensive methods section aims to be transparent about which factors are and are not included in this study. Due to the limitation of time constraints, the researcher has decided for quality over quantity. Triangulation of sources and multiple analysing frameworks were used to improve the quality of data and findings. Time constraints have also led to limited flexibility in the sampling size. To make this research externally valid and transferable, a greater and more diverse stakeholder group needs to be interviewed. However, little research has yet been done in this field. Being an explorative study, these drawbacks do not represent a threat to the validity of the study. In fact, according to social sciences practice, the reliability and credibility of the study are given by local stakeholders cooperating and interest in research outcomes. By portraying and discussing the diverse perspectives of stakeholder groups, system dynamics are portrayed. Other than the interest in giving good advice, no personal bias is expected to have impacted the research outcomes.

6. Conclusion & Recommendation

This thesis has investigated the tourism resilience in the Harz region by defining climate change exposure, sensitivities and vulnerabilities in tourism system and resources, developmental plans for adaption to changing conditions and finally discussed barriers to destination resilience and opportunities to overcome those. The Harz is moderately vulnerable to climate change and especially impacted by increasing temperatures and extreme weather events such as storms and floods. A bark beetle plague, as well as destruction through extreme weather events, will threaten the natural beauty of the region which is its main selling point in tourism. The region depends on tourism and resource competitions increasingly threaten economic benefit. A great share of tourists demands a climate and environmental friendly destination which create opportunities for adapted development. The current approach to governance activity within the region hinders resilient development, however, can yet be improved with a few considerations. The research suggests investing in networking and cooperation between tourism stakeholders. Joint initiatives to destination development are the basis for destination resilience, destination competitiveness and economic growth. Trust, leadership and adaptive governance patterns can be established to facilitate networking practices.

This research used the destination resilience approach to uncover barriers to climate change adaptation in an average German tourist destination. It shows that although the impacts are diverse and intermittent, the adaptation possibilities draw back to trust and networking. Although specific actions for improving destination resilience are place-bound, the insight that networking is the starting point for any tourism system change is important. The research is explorative in applying the destination resilience model to climate change implications. For further research, I suggest to deep further into the topic and analyse how climate change impacts the system in the long term and how adaptation methods mitigate or impact the tourism system. This may be done by doing a Story-Simulation approach and Fuzzy Cognitive Mapping (Kok, 2009). Such semi-quantitative methods can generate great insight into the perspectives of a great number of stakeholders and simulate destination resilience over time. Further, I suggest conducting similar research in other destinations slowly threatened by climate change stressor to generate a greater knowledge pool of climate change impacts on destination resilience. To conclude I would like to give destination managers five recommendations for increasing destination resilience. A further investigation into each of those aspects by academic research may define their value for a greater amount of destinations. Those recommendations are:

1. Acceptance and leadership of Harz Tourism Association (Harzer Tourismusverband)
2. Internal marketing for networking and joint destination planning
3. Stronger regulations about subsidies and their allocation
4. Creation of a strong community to effectively respond to large-scale investors
5. Improve the relationship between management and research to create suitable and qualitative solutions.

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9. Appendix

Appendix 1: Interview Questions

Adapted after Pyke et al (2014) and Calgaro et al (2014):

Management bei Wetterextremen

1. In den letzten Jahren kam es häufiger zu Überschwemmungen und starken Stürmen in der Region. Wie haben sich diese auf Natur und Einwohner ausgewirkt?
2. Welche Auswirkungen haben Wetterextreme auf den Tourismus?
 - Image der Region?
 - die Attraktivität der Natur?
 - die Wirtschaftlichkeit des lokalen Tourismusgeschäftes?
 - die Erreichbarkeit der touristischen Ausflugsziele?
3. Wie wurde Abhilfe geleistet, wenn ein Wetterextrem Verwüstung hinterlässt? Wer ist verantwortlich für Management, Kommunikation, Finanzierung?
4. Durch den Klimawandel wird prognostiziert, dass diese Extreme öfter vorkommen können.
 - *Vorbereitung:* Wie bereiten Sie (oder die Unternehmer) sich auf diese Situationen kurzfristig vor?
 - Und längerfristig?
 - Wie können diese Vorbereitungen Ihrer Ansicht nach verbessert werden?
 - Gibt es einen Krisenplan für den Tourismus? Was sind die Hauptpunkte?

Fragen aus dem Bereich des Tourismusmanagements zur Klimaanpassung.

5. Wie wird der Klimawandel in Touristische Zukunftskonzept eingearbeitet? Was funktioniert gut? Was hindert die Vorbereitung der Region?
6. Welche politischen Regulationen und Initiativen verbessern oder hindern die erfolgreiche Anpassung?
 - Was denken Sie über den Fakt, dass Geld der europäischen Union für Wirtschaftsförderung in eine neue Lift- und Beschneiungsanlage am Wurmberg geflossen sind? Hätte das Geld Ihrer Meinung nach für etwas anderes eingesetzt werden sollen?
7. Welche Tourismuszweige werden Ihrer Meinung nach am meisten vom Klimawandel beeinflusst werden? Wer wir Schwierigkeiten haben, seinen normalen Betrieb beizubehalten?
8. Welchen Einfluss wird die Veränderung der Touristenströme durch den Klimawandel auf die Einwohner haben? (*social vulnerabilities*)

9. Wie bereiten Sie sich langfristig auf die wärmeren Winter und Sommer vor? Wie wird sich der Tourismusmarkt verändern?