MASTER IN MANAGEMENT OF TOURISM DESTINATIONS

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THE IMPACT OF BELGIUM'S 2021 FLOOD ON THE TOURISM SECTOR AND SUSTAINABLE TRANSITION: A GENERAL ANALYSIS

FINAL MASTER PROJECT

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LIST OF ABBREVIATIONS

CGT	Commissariat Général au Tourisme
CRED	Centre for Research on the Epidemiology of Disasters
DSF	Destination Sustainability Framework
EM-DAT	international disasters database
ETIS	European Tourism Indicators System
EU	European Union
EUC	European Commission
GVA	Gross Value Added
IPCC	Intergovernmental Panel on Climate Change
ISTO	International Social Tourism Organisation
ORC	Regional Commercialization Tool
SDG	Sustainable Developments goals
TCI	Tourism Climate Index
TVASS	Turner's Vulnerability Analysis for Sustainability Science
UNTWO	World Tourism Organisation
WBT	Wallonie Belgique Tourisme

ABSTRACT

Natural disasters, especially floods, are becoming more frequent and severe due to climate change, affecting billions of people worldwide. On July 14th, 2021, Wallonia, Belgium, experienced its worst flood, which resulted in human and economic losses, with severe impacts on its tourism sector. This paper explores the economic and social impacts of the flood on the tourism industry in Wallonia and how it has influenced the industry's transition toward sustainability. Based on stakeholders' responses, the study assesses how the disaster has shaped perceptions of sustainable practices and the resilience of tourism operations. It also reviews new initiatives, policies and improved governance that arose as recovery and adaptation measures.

Keywords: Tourism, Natural Disaster, Flood, Sustainability, Climate Change, Belgium

1 INTRODUCTION

Disasters are faced everywhere in the world with 80-90% of all documented disasters from natural hazards during the past 10 years being floods, droughts, tropical cyclones, heat waves and severe storms (World Health Organization, 2019). In a world undergoing climate change, no one is safe from experiencing tragic events. Even in areas where people never expected such disasters to occur.

On July 14th 2021, Wallonia, Belgium has faced the most devastating flood of its history. This catastrophe has left 100 000 people without a home, taking the lives of 39 individuals. Despite the rapid activation of emergency response, with thousands of volunteers and emergency professionals mobilized as early as the day after the event, the psychological impact has left a permanent mark on the local population (Boverie et al., 2022).

The World Health Organization (2019) classifies flood as one of the most recurrent and devastating kind of natural disaster, affecting 2 billion people worldwide in the period of 1998-2017. They also alert that floods are becoming more frequent and severe, with extreme precipitation events expected to intensify further due to climate change.

The World Disasters Report 2020 emphasizes the increasing threat of disasters in a changing climate. It underscores the importance of reducing risks and enhancing resilience by investing in effective climate and disaster risk management practices. Currently, half of the population is facing the consequences of climate change which may lead to potential changes in our lifestyles (Despre, 2022).

When a country is hit by disasters, it has a widespread impact on its economy, society and environment, and the tourism industry is not spared. The tourism industry is even higher at risks due to its dependence on the attractiveness and safety of destinations. Disasters can lead to a decrease in visitor numbers, cause harm to infrastructures and economies which can disrupt tourism operations significantly. These consequences go beyond physical damage and impact the sustainability and resilience of tourism destinations in the long run (Rosselló et al., 2020).

In order to promote and foster sustainable tourism destinations it is essential to understand the relationship between disasters, tourism and sustainable practices. This master thesis will attempt to contribute to this understanding through a detailed case study of Wallonia, Belgium, and the flood of 2021. It will specifically focus on examining the effects of disasters on tourism destinations and explore how they contribute to moving towards sustainability goals.

The disaster that hit Wallonia happened at the beginning of the summer holiday, the main tourism season in Belgium. Once again, after the 2019 pandemic, the tourism industry is facing a new crisis. In an already weaken sector, tourism professionals had to be innovative in order to overcome the new challenges. At this point, there have been very few studies and analyses attempting to measure the extent of the flood's impact – both economic and social – on Wallonia's tourism sector. Nonetheless, some preliminary data is available that indicates the trend:

With 47 tourist attractions that had to remain closed for a period of at least 5 days following the disaster, the Professional Association of Tourism Attractions (Brussels-Wallonia) estimates the loss of over 18 million euros in turnover and not less than 620.000 of visitors in comparison with 2019 (Parent, 2023). Michel Vankeerberghen, director of the association also points out that after reopening, most attractions still noticed a decrease of up to 50% of number of visitors. He emphasis that the psychological impact these images have had on visitors should not be underestimated and that there will need time to forget and to be able to enjoy these places again (Colamonici, 2021).

Those few isolated analyses are unfortunately not enough to try to understand the phenomenon as a whole and to build an effective and exhaustive judgment on the topic. Furthermore, some authors and theories suggest that devastating events can be the turning point, offering opportunities for innovation and resilience. For example, the Chaos Theory outlined by Gleick (1987) illustrates how disasters boost creativity and adaptability among people and communities. This principle can also be observed in tourism destinations. When a disaster strikes, the immediate impact disrupts the existing order, creating a chaotic situation that forces stakeholders to rethink and redesign their approaches. This disruption opens up opportunities for creative problem-solving and the implementation of new strategies that might not have been considered under normal

circumstances (Faulkner, 2001). Exploring this path is quite interesting in our changing society especially when considering the urgent matters of climate change and sustainability.

De Beer De Laer & De Myttenaere (2023) analysed the social representation of sustainable tourism in Wallonia. The study revealed that climate change is not particularly perceived as a priority issue with only 23% of the stakeholders interviewed including “adaptation to climate change” as top 3 priority challenge for the next 20 years. The majority of interviewees recognize the overarching challenges of sustainability, nature protection, and the green transition, but express concerns about how to effectively implement these initiatives. As representative as the results have been in the past, Wallonia has faced various challenges, including the flood since. The study will need to be updated in order to capture today’s reality. As an attempt to build on the past studies and reflections, this paper will focus on answering the following research question:

How did the 2021 flood in Wallonia impacted the tourism industry and to what extend did it influence its sustainable transition?

It will focus on three main objectives:

1. Assess the economic and social impact of the flood on the tourism industry and its stakeholders, measuring the destination’s resilience;
2. Evaluate stakeholders’ post disaster perception and engagement in sustainable practices;
3. Review new policies developed by policymakers as part of the recovery and reconstruction response.

The rest of the paper is organized as following. Section 2 reviews the literature and gives a summary of what other studies have analysed. Section 3 develops the methodology. Section 4 delves into the flood of July 2021. Section 5 explores the tourism industry of Belgium. Finally, section 6 presents and discusses key findings, provides recommendations and suggests possibilities for further research.

2 LITERATURE REVIEW

2.1 HISTORY OF "NATURAL" DISASTERS

When listening to the news, it is not rare to hear about natural disasters hitting countries and their populations. The world will never forget hurricane Katrina in 2005 and the intensity with which it hit Louisiana; Haiti's earthquake, one of the deadliest of the 21st century in 2010; the Australian wildfire in 2020 burning more than 10 million hectares of forest, to only cite a few of them. In Europe, heatwaves, floods and fires have become a recurrent topic and a fear for local populations (World Disasters Report, 2020). Natural disaster and all the associated terms have become widespread words that are often misused. It is, therefore, important to define these concepts by going back to their etymology.

Mizutori (2020) argues that there is no such thing as "natural" disaster as according to him disasters result from the impact of a hazard on a community that lacks sufficient resources or organization to manage the event effectively. He emphasises that disasters are the combination of natural hazards with exposure and vulnerability.

Disaster = Hazard + Exposure + Vulnerability

Hazards are the interplay between natural occurrences and a human system which convert the natural into a hazard. Hazards should not be feared but rather have to be seen as a potential danger that could cause damage and/or harm (Chaudhary and Piracha, 2021). The Oxford English Dictionary (n.d.) defines exposure as: *"The action of exposing; the fact of being exposed. The action of uncovering or leaving without shelter or defence".* If we adapt this definition to the context of disaster, it means that natural hazards occurring in areas where people and infrastructure are unprotected or insufficiently prepared could have a damaging impact. However, if the that same hazard occurs in areas that have the capacity to absorb it, no harm should be caused (Chaudhary and Piracha, 2021).

The Centre for Research on the Epidemiology of Disasters (CRED): International disasters database (EM-DAT), (n.d.) classifies natural hazards into 6 subgroups, as seen in figure 1: Geographical, Hydrological, Meteorological, Climatological, Biological, Extra-terrestrial.

Figure 1: Natural hazards classification (EM-DAT, n.b.).

Vulnerability refers to the degree to which a community or system is subject to damage caused by a hazard (Becken et al., 2014). Less developed and poorer countries are usually more vulnerable to hazards. It is also important to understand that exposure and vulnerability change according to the area exposed and over time. It is, therefore, needed to asses and reassess over time the degree of disaster risk and define its potential mitigation strategies (Ritchie & Roser, 2024).

Figure 2: The components of disasters and assessment of disaster risk (Ritchie & Roser, 2024)

Disaster is defined as an event, whether caused by nature or humans that requires exceptional measures from the community impacted (Sahni, 2003). More precisely, the CRED (n.d.) defines disaster as: "*a situation or event which overwhelms local capacity, necessitating a request to a national or international level for external assistance; an unforeseen and often sudden event that causes great damage, destruction and human suffering*". The EM-DAT (n.d.) accounts events as disasters when: "*at least 10 or more people were killed and/or 100 or more people were affected and/or whether a declaration of a state of emergency was announced and whether a call for international assistance was issued*".

Disasters have always struck and they are not likely to stop nor decrease. On the contrary, a recent study analysed the history of disasters and occurrences from 1960 to 2018 taking into account the magnitude and scale of those events, determining the trends. The occurrences were analysed in an attempt to predict the tendency for the next 20 years. Figure 3 represents the evolution of disaster according their categories over time and reveals predictions for the next 20 years. The graphs show disaster occurrences rising over time and the forecast does not presage any decline (Buszta et al., 2023).

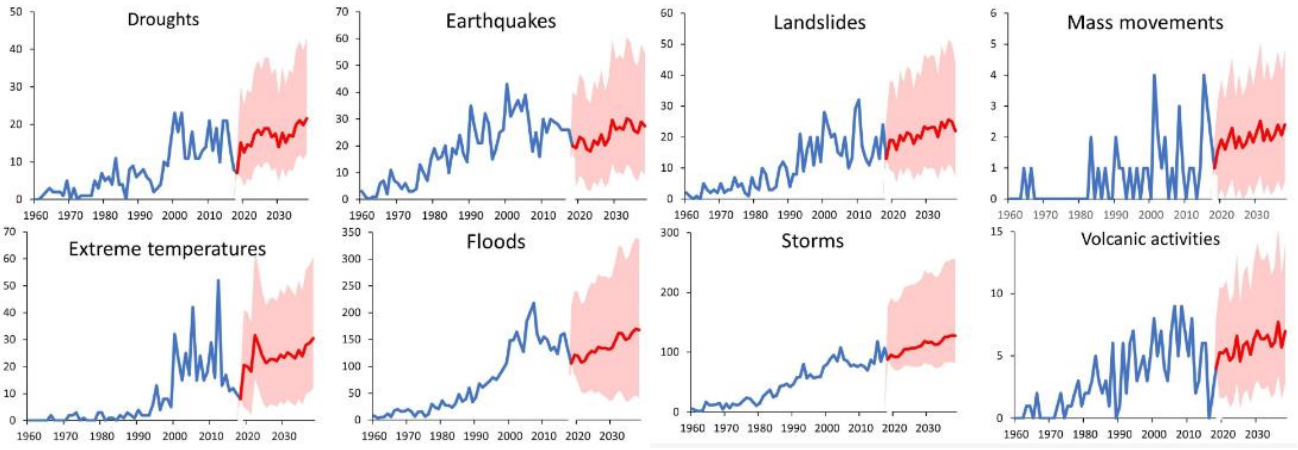


Figure 3: Disasters according their categories from 1960 to 2018 and predictions for the next 20 years (Buszta et al., 2023)

Looking at graph 4, which represents the number of annual deaths worldwide from disasters, we could assume that the number of events has decreased, which would be controversial to Buszta et al.'s analysis but would explain the decrease in number of deaths.

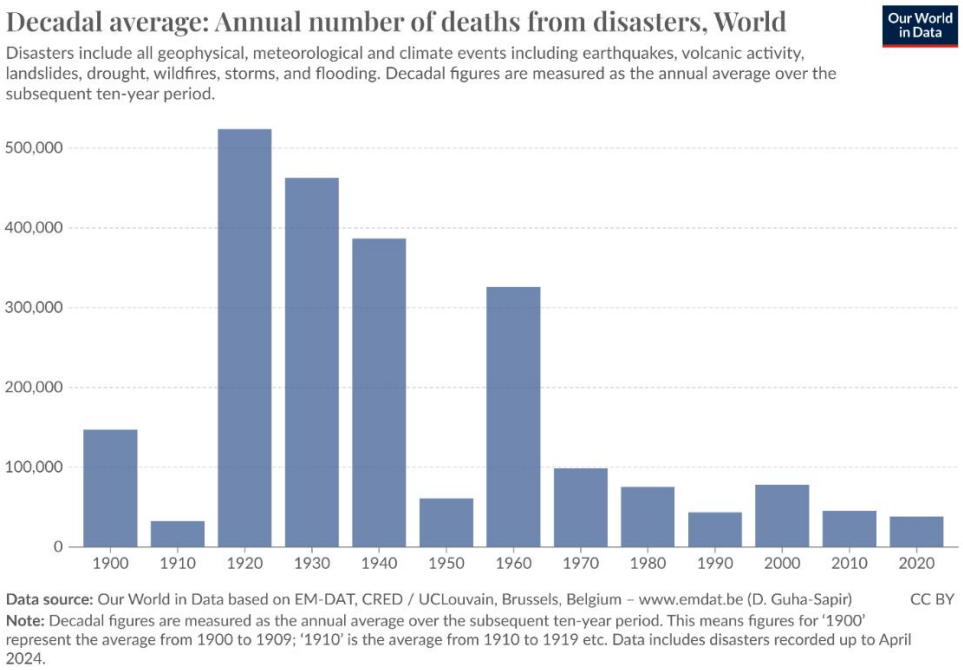


Figure 4: Annual number of deaths from natural disasters (Ritchie & Roser, 2024)

According to Ritchie & Roser (2024) this decline is attributed to advancements in technology that have enabled us to better anticipate and project such occurrences. Weather predictions have become more reliable over time which helps to better prepare for emergencies such as disasters. Governments operations that ensure the safety of individuals during such events have also evolved, speeding up the recovery. People have become richer with easier access to basic needs and support during the aftermath, making them more resilient to hazards. Experts affirm that there is a close connection between the rise of disasters and global warming. They explain that the number of hazards is rising due to climate change but that the exposure to those hazards is also on the rise due to demographic growth and urbanization making populations and areas more and more vulnerable.

2.2 DISASTERS IN TOURISM DESTINATIONS

Tourism plays a big role in regional growth and development in many areas. However, events like disasters can significantly threaten the resilience of tourism destinations. This section outlines the concept of resilience within the tourism sector, drawing on Walker, B et al.'s (2004) definition: *"Resilience is the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks*".

Disasters, whether sudden or progressive, have severe impacts on tourism destinations. Given the inevitability of such events, and their usually devastating consequences, the tourism industry must prioritize rapid recovery and effective management strategies. Disasters can harm a destination's reputation which goes beyond just economic impact. In addition to financial consequences disasters can deeply affect people's emotional well-being and the overall quality of life in communities impacted by the calamity. The recovery of tourism in these areas relies heavily on how residents handle the emotional challenges. Additionally, addressing people's risk perception is also crucial in reviving a destination after a disaster. Mass media play a big role in sharing negative publicity that reinforce the bad image of the destination. It can sometimes take as long as the complete recovery of the area to restore the good image and reduce people's risk perception (Rosselló et al., 2020). Post-disaster recovery involves not only restoring the destination's image but also diversifying markets and products, potentially creating new attractions that can or not be based on the disaster event (Tucker et al., 2016).

Despite the known vulnerabilities, Prideaux et al. (2003) highlight that the tourism industry is often unprepared for disasters, lacking both awareness and appropriate planning. Wang & Ritchie (2012) further note deficiencies in responsibility and resource allocation for disaster management. Mansfeld (1999) argues that crisis management should be a continuous process rather than a one-time response. Effective crisis management is essential, as unpredictable changes pose significant challenges for destination managers. Tourism crisis management strategies differ across destination and can be categorized with two primary approaches: proactive or reactive. The proactive approach involves monitoring and mitigating potential crises, while the reactive approach

focuses on post-event responses such as government aid and promoting domestic tourism. A proactive strategy is generally more efficient, although it must be adapted to the specific disaster and destination context (Kaklauskas et al., 2009).

Western organisations often use the PPRR (Prevention, Preparation, Response and Recovery) crisis management model that was first developed by the American Governor's Association in 1978. It is a continual process that emphasizes continuous learning to manage disaster situations effectively. Developing plans and educating stakeholders is part of the Prevention and Preparation Process. Immediate actions to manage the crisis refers to Response and long-term efforts to restore normalcy is the longer process undertaken during the Recovery (Cronstedt, 2002). This comprehensive approach has gained recognition around the world and is still being used as crisis management foundation by many countries when facing emergencies and disasters. However, in more recent literature, various authors started questioning the effectiveness and comprehensiveness of the model within today's reality. Even Cronstedt, (2002), highlights the limitation of its own model that he qualifies as constraining in contemporary emergency management.

The following section will review the evolution of crisis management models over time.

In his work, Faulkers (2001) introduces a new framework that integrates key principles of the PPRR adding preparedness and evaluation to his approach. His framework is comprehensive, covering all disaster management phases with a focus on strategic planning and coordination. His approach considers the tourism ecosystem as an interconnected system involving tourism operators, local communities, the public sector and tourists. He also highlights the importance of interdependence, coordination, communication, flexibility, and long-term sustainability. As well, he incorporates the *Chaos Theory*[1], viewing crises as opportunities for innovation and resilience.

In 2003, Turner et al. introduced "Turner's Vulnerability Analysis for Sustainability Science (TVASS)" to frame vulnerability analysis within sustainability and global environmental change.

[1] The Chaos theory was developed by Gleick, J. (1987) in his work: "Chaos: Making a new science".

Compared to other models, TVASS highlights the dynamic and diverse nature of vulnerability by acknowledging that levels of exposure, susceptibility and resilience can vary over time and space. The model highlights the importance of having access to resources which influences how individuals or communities react to shocks (Turner et al., 2003).

Calgaro et al. (2013) introduced the Destination Sustainability Framework (DSF) which enhances disaster management approaches by focusing on sustainability and resilience of tourism destinations. This framework details how different elements like population, environmental circumstances and infrastructure (exposure), interact with particular vulnerabilities (sensitivity), which influences the overall risk of a system. The DSF highlights the significance of a systems capacity to adjust both in immediate and long term response (system adaptability) with the aim of enhancing or reducing risks levels. By incorporating the principles of space, scale and time, it presents a comprehensive methodology for understanding how behaviours and processes influence the vulnerability and resilience of tourism destinations over time.

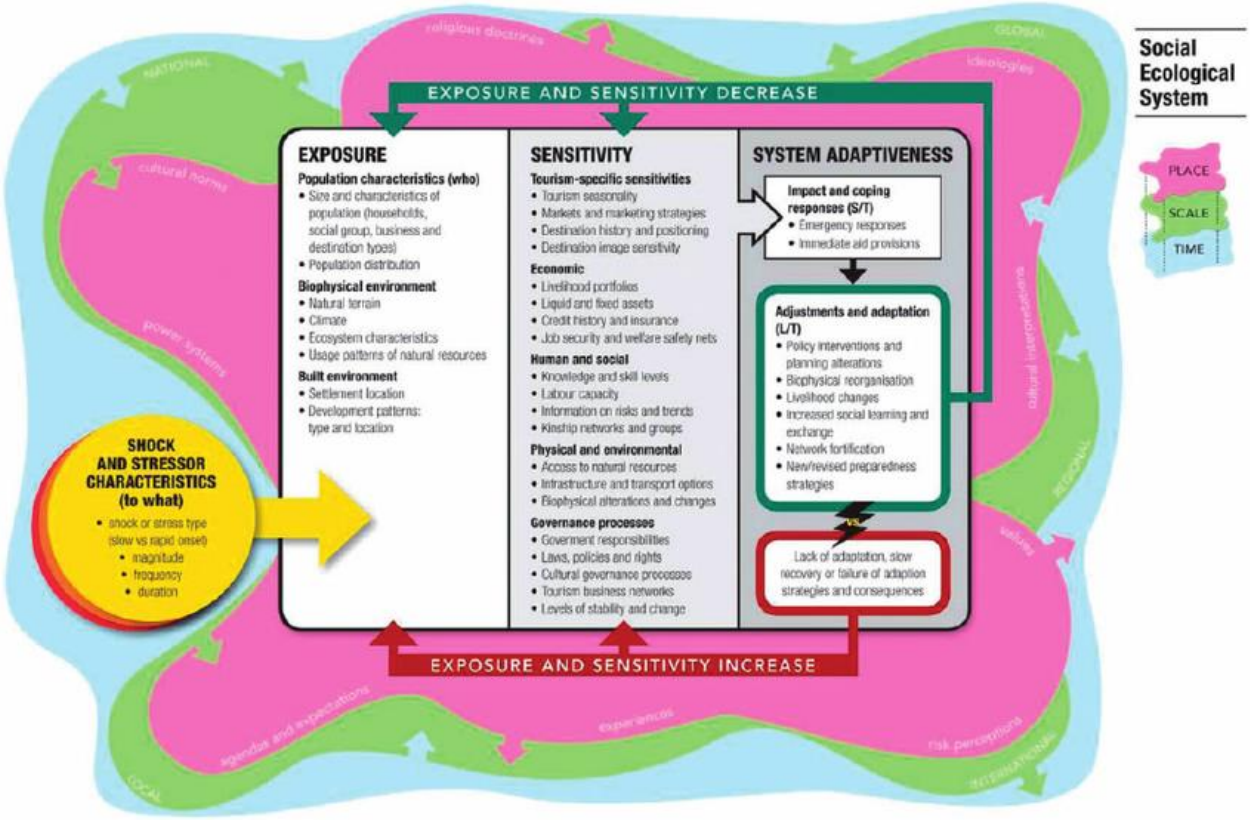


Figure 5: Destination Sustainability Framework (DSF) (Calgaro et al., 2013)

2.3 SUSTAINABLE TOURISM

Before delving into the complexity of the subject, it is essential to define the notion of sustainable tourism. This idea is considered recent as it was officially recognized for the first time during the Rio Earth Summit in 1992.

Butler (1999) differentiates between " sustainable tourism" and " sustainable development in the context of tourism". He explains that sustainable tourism focuses on maintaining a form of tourism that can be maintained indefinitely without decline. On the contrary, sustainable development in tourism involves establishing tourism within a destination in a way that safeguards its long-term viability without harming the environment, while also supporting the growth of other activities. This distinction shows the need to not only practice sustainability within tourism but also to ensure that tourism contributes positively to the broader objectives of sustainable development.

The World Tourism Organisation (UNTWO) (n.d.) defines sustainable tourism as *"an activity 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".* In other words, sustainable tourism seeks not only to minimize negative environmental impact but as well social and economic aspects have to be considered. A sustainable economy in a tourism destination means that the local population benefits economically from tourism, for example by creating new jobs or increasing income to reduce poverty. The protection of world cultural heritage sites and the respect of traditions and values of local communities is also important and refers to social sustainability. Achieving sustainable tourism in a destination requires comprehensive planning and support across the economic, social and environmental dimensions.

2.3.1 THE IMPORTANCE OF SUSTAINABLE TOURISM IN CLIMATE CHANGE

Climate change has become without a doubt the burning topic of the 21 centuries. There is no longer any doubt among experts about climate change, and tourism also plays a bigger role than it seems. We are not only talking about the impact of climate change on tourism, but rather that tourism is also a major contributor to climate change, especially in terms of greenhouse gas

emissions. A recent analysis reveals that between 2009 and 2013, tourism's global carbon footprint increased from 3.9 to 4.5 GtCO2e (gigatons of carbon dioxide equivalent[2]), accounting for about 8% of global greenhouse gas emissions, with transport, shopping, and food being major contributors in high-income countries (Lenzen et al., 2018). Figure 6 shows the repartition of carbon footprint of global tourism.

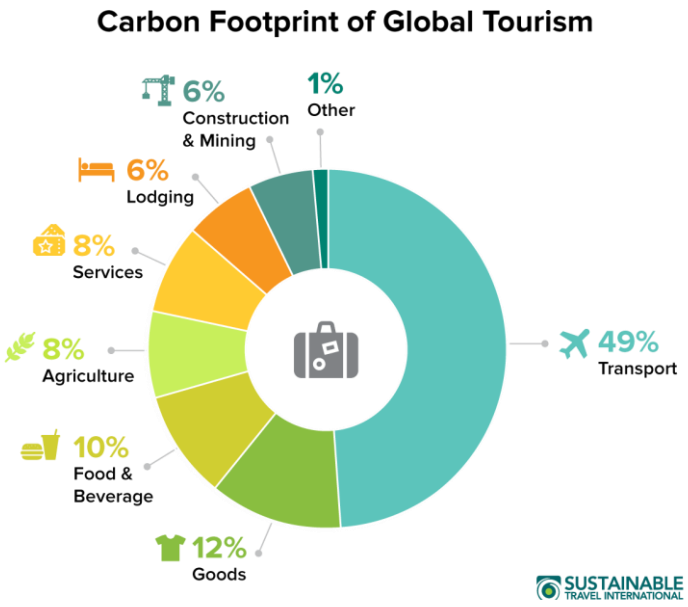


Figure 6: "*Carbon Footprint of global Tourism*" (Sustainable Travel International, 2020)

In the latest Glasgow Declaration, the UNTWO (2021) emphasises the need for cooperation between all tourism stakeholders to reduce greenhouse emissions. They declare that the tourism industry will align with the sustainable development goals aiming toward a Net Zero before 2050 with a decrease of 50% of their emission by 2030 maintaining an increase of no more than 1.5°C above pre-industrial levels by 2100.

The UNTWO suggests two alternative solutions: (1) to motivate travellers to opt for short-distance destinations and to increase the use of public transportation while reducing reliance on air travel; and (2) to offer market-driven incentives for tourism businesses to enhance their energy efficiency

[2] Unit of measurement used to compare the emissions of different greenhouse gases (GHGs) based on their global warming potential (GWP) relative to carbon dioxide (CO_2) (ORAPI Asia, 2024).

and reduce their carbon emissions (Scott et al., 2008). However, Lenzen et al. (2018) highlight the challenge of implementing such strategies as they point out that the biggest sources of tourism emission such as the United States did not sign the Paris agreement[3] on climate change. The UNTWO (2023) reinforces that if tourism is well planned it could significantly contribute to the achievement of the Sustainable Developments goals (SDGs) by driving economic growth, creating employment opportunities, reducing inequalities and fostering cultural and environmental sustainability. The tourism industry being the 3rd biggest export industry worldwide has the power to take the lead into the transition and to serve as role model (UNTWO, 2021).

On another end, climate change presents challenges for the tourism industry as it is heavily impacted by changes in weather patterns and environmental elements such as increasing sea levels and extreme weather events that can disrupt travel plans and damage the attractiveness of tourist destinations. For instance; ski resorts may witness a reduction of snowfall, beachfront resorts might experience erosion issues and natural sites could face biodiversity loss. Consequently, the industry must adopt methods to secure its long-term sustainability.

Within their 2030 Tourism agenda, the EU identifies coastal areas – which contains 51,7% of EU accommodation – as the most vulnerable to climate change. They also indicate that rural areas - which contains 32,9% of EU accommodation – are also considered rather vulnerable due to their economy relying heavily on tourism (European Parliament, 2021).

In a study conducted at the European Commission (2023), experts investigate the effects of climate change on tourism demand in Europe by region. They found that countries in Europe that are heavily dependent on summer tourism face increased vulnerability due to rising temperatures and heatwaves. In contrast, regions in the north could see a rise in tourists attracted by favourable weather conditions. They tend to measure the attractiveness of tourism destinations according to

[3] "*The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris, France, on 12 December 2015. It entered into force on 4 November 2016" (*UNITED NATIONS, 2015). The agreement was completed during the last COP26 (2020).

various variable such as wind, precipitation, hours of sunshine, temperature, etc. with a Tourism Climate Index (TCI) that goes from 0 to 100; respectively impossible conditions to ideal conditions for tourism. Figure 7 illustrates the spatial distribution and intra-annual variation of the TCI during the historical period from 1981 to 2020.

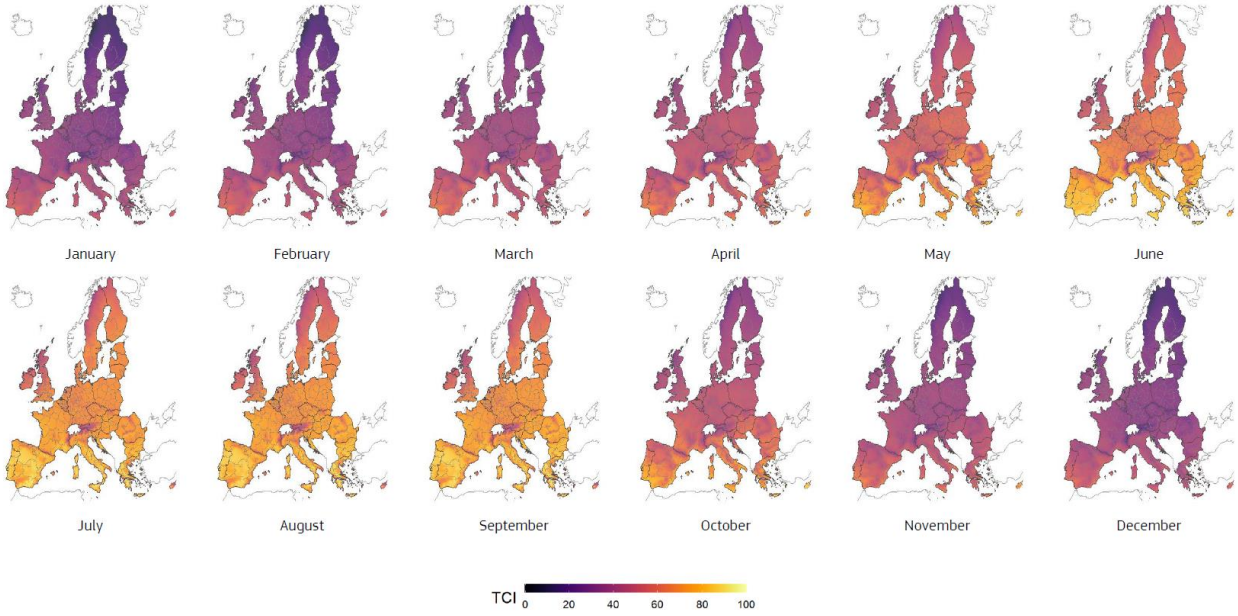


Figure 7: "*Spatial pattern and intra-annual variability of the TCI for the historical period 1981-20",* (European Commission, 2023).

Additionally, the analysis sets up some predictions for the evolution of the European tourism demand based on the global warming expectation according to the Paris Agreement taking year 2019 as point of comparison. They have calculated the changes for 1,5°C and 2°C as well as two higher temperatures respectively 3°C and 4°C. The representations are presented as percentage in figure 8. As mentioned above, we can see that the northern countries are more likely to benefit from global warming (in terms of tourism demand) while southern countries will face some severe decrease in number of arrivals. The study specifies that the overall European tourism demand will not likely decrease but rather experience a shift. The higher the increase in temperature, the larger the shift will be, with the southern part experiencing impossible weather conditions. Mitigation strategies will need to be developed in order to tackle this shift in travel patterns.

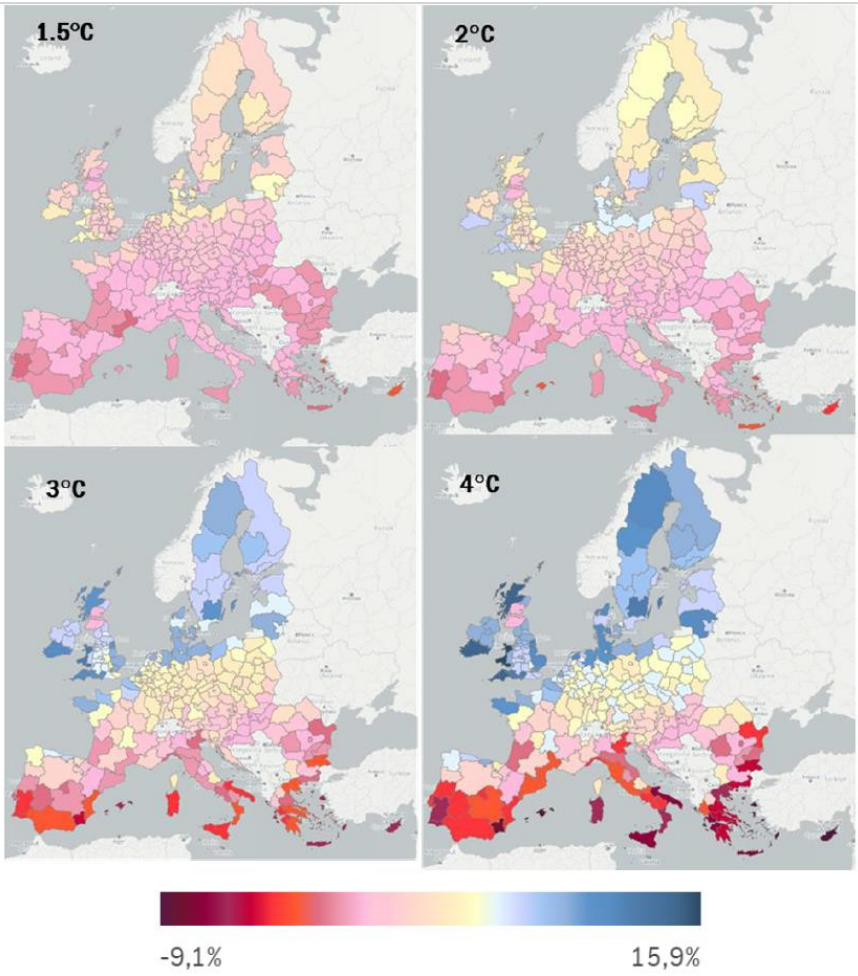


Figure 8: "*Projected evolution of the European regional tourism demand for all the global warming scenarios, compared to the present (2019) in percentage terms*" (European Commission, 2023).

However, we could argue that this study is slightly controversial. If global warming exceeds 3°C above pre-industrial levels we could imagine that other much more alarming issues will arise with various extreme events that could put in jeopardy the basic survival needs of each individual. We can therefore presume that tourism will be held in the background.

The above chapter has laid out the importance of sustainable practices for the well-being and resilience of tourism and in a bigger picture, the preservation of the planet. Now, what exactly is meant by sustainable practices? And at which level does those measures have to be taken in order to achieve the sustainable development goals?

2.3.2 SUSTAINABLE TOURISM IN THE EUROPEAN UNION

The international guidelines of the United Nations provide the framework for sustainable development in the European Union (EU). The EU's guidelines are based on the 2030 Agenda and its 17 SDGs, which aim to achieve sustainable development by 2030. Tourism, recognized as a significant tool for sustainable development, is not overlooked in Europe (UNWTO, 2023). Although the EU does not have direct authority over tourism competencies, it has issued a roadmap to assist its member states aligning with the recommendations of the 2030 Agenda on the green and digital transition (Council of The European Union, 2022). The roadmap focuses on 5 key areas; Green Tourism, Digitalisation, Skills, MSMEs, Destination Management (Cf. annex 1).

Several years earlier, various efforts to establish sustainable tourism practices started to emerge in Europe. In 2007 the European Commission published an agenda that promoted sustainable and competitive tourism across Europe. This agenda laid the groundwork for sustainability programs in the tourism industry (European Commission, 2007). At that time, the focus was mainly on financial support for innovative and sustainable tourism projects.

In 2012, the European Charter for Sustainable Tourism in Protected Areas was introduced by the EUROPARC Federation, giving the opportunity to businesses to get certified. This Charter serves as a practical management tool to ensure that tourism in protected areas is managed in a sustainable way (EUROPARC, 2023). For areas with protected biodiversity and species, the EU had already established Natura 2000 as protection program (European Union, 2017)

The successful measurement and application of these solutions were enabled by the European Tourism Indicators System (ETIS) launched by the European Commission in 2013. This document, containing up to 40 indicators, was crafted to help member states evaluate their sustainable tourism management and to provide suggestions for improvements. These guidelines align with the 2030 Agenda and urge member states to intensify their focus on sustainability (European Commission, 2022). In 2021, recovering from COVID-19, the EU adopted the most comprehensive guidelines in achieving neutrality within the tourism sector by 2050: the European Green Deal (European Commission, 2021).

3 METHODOLOGY

3.1 RESEARCH DESIGN

The study is structured as an analysis of the real-life scenario of Wallonia, Belgium delving into the immediate and long-term consequences of a major natural disaster on the tourism industry. The use of a case study approach enables an investigation into the aftermath of the flood of 2021, on the tourism sector, resulting in an in-depth understanding of the challenges and opportunities emerging from such situations. The study uses the DSF developed by Calgaro et al (2013) to assess Wallonia's resilience as a tourism destination, covering aspects of sustainability such as environmental, social and economic factors. It explores how these factors shaped the regions capacity for recovery from the crisis and moving towards more sustainable tourism approaches.

3.2 DATA COLLECTION AND ANALYSIS

For the study, organised and analysed secondary data were used to achieve the research objectives. Secondary data was gathered from reliable sources such as government reports, academic journals, industry studies, statistical databases and local newspapers. A systematic review of the collected secondary data was conducted to assess the impacts of the flood and to evaluate the effectiveness of the sustainable practices implemented in the region.

The analysis is structured around the following key areas:

- Economic and social data

The research explores the direct and indirect economic and social impact of the flood on the tourism sector. Economic statistics include income generation, visitors number, employment statistics, etc. It further investigates consequences such as shifts in community perception and stakeholder resilience. Quantitative economic data is gathered from government publications, industry reports and statistical databases. Social changes are assessed by consulting stakeholders' surveys and examining industry reports.

- Sustainable practices and governance frameworks

The study examines data regarding the development and implementation of strategies in Wallonia prior to and following the flood event. This encompasses regulations, policies, and frameworks concerning tourism and crisis management and how they have evolved in reaction to the flood incident. It assesses the degree to which sustainable practices were implemented or improved as a response to the flood by comparing sustainability effort pre and post disaster and assessing how effective these strategies are in fostering resilience, within the tourism sector.

- Policy interventions and recovery strategies

It explores policies developed by regional authorities following the flood incident such as recovery plans, initiatives to promote sustainable tourism and investment approaches. It analyses policy documents, recovery strategies and governance reports to understand how the region’s response to the disaster corresponds with development targets. The study evaluates the strategies used for reconstructing the tourism industry and the significance of policies in long-term resilience and sustainability.

4 THE FLOOD OF JULY 2021 IN WALLONIA, BELGIUM

Extreme events have been recorded in Wallonia since decades. Since 1994, experts in Wallonia collected, mapped and analysed each event in order to identify them, plan and develop mitigation strategies (Michel & Van Dijck, 2010). The most frequent natural hazards faced in Belgium are either hydrological (flood and landslide) or meteorological (extreme temperature and storm) (EM-DAT, n.d.). The flood that struck in July 14th and 15th 2021 in Wallonia is known as the most devastating of the last 200 years in the history of Belgium. During this time Wallonia faced a period of heavy rainfall that led to severe flooding. The heavy rain was mainly due to a weather phenomenon known as a "cold drop" which kept a concentrated rain zone stationary over the area. This led to high levels of rainfall with some areas receiving more than 200 mm in just two days, surpassing the usual rainfall for two whole months. Rivers like the Meuse, Vesdre and Ourthe overflowed their banks submerging towns and villages. The immediate consequences were significant; 41 lives lost, thousands displaced and widespread damage to infrastructure amounting to billions of euros. Specific regions and towns such as Jalhay et Spa recorded rainfall levels of 271,5 mm, 217,1 mm, respectively, within 48h, as seen in figure 9. On Wednesday 14th, the Royal Meteorological Institute (IRM) issued the highest level of alert, highlighting the severity of the situation (Binamé & Laboratoire de Climatologie de l'Université de Liège, 2021).

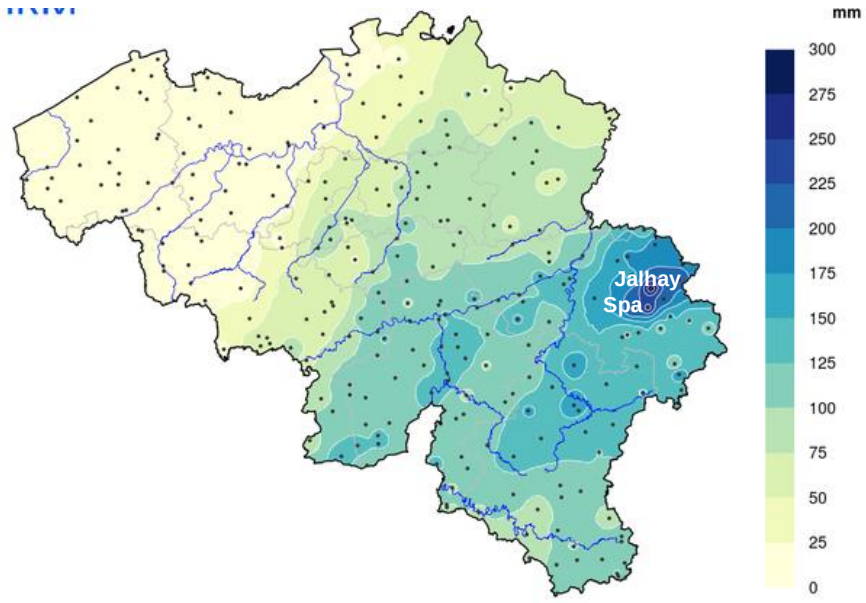


Figure 9: Total rainfall of 3 days for the period 13th – 16th July 2021 (IRM, n.d.)

Several factors contributed to the flood's devastation. An anticyclone over the Atlantic blocked the usual westward flow of weather, trapping moist air over Belgium. This, combined with Wallonia's topography, where higher altitudes forced the moist air to ascend and cool rapidly, led to intense and long rainfall. The rain persisted over the region for more than 48 hours. It is important to point out that 2021 has been a particularly wet year resulting in saturated soil, unable to absorb the extreme amount of water that fell over a such short period of time (IRM, n.d). In response to the disaster, rescue efforts were given, and affected residents along rivers were instructed to elevate their belongings and evacuate if required.

In the aftermath, everyone is asking the same question: could this tragic event have been avoided?

4.1 FLOOD CRISIS MANAGEMENT SYSTEM

To understand the efficacity of Belgium's flood crisis management system, it is important to analyse the particular case of July 2021. This sub-chapter will mainly focus on emergency responses.

KEY INSTITUTIONS IN CHARGE OF FLOOD CRISIS MANAGEMENT IN WALLONIA

Crisis management involves a vast and complex range of stakeholders and institutions, at different institutional levels, that all have a defined role. The chronology and the accuracy of their actions all have an impact on the efficiency of the crisis management response. Below is a non-exhaustive list of the key players:

- **Royal Meteorological Institute (IRM)**: federal institution in charge of weather prediction and issuing alerts for weather conditions like rainfall, storms and other meteorological events that may cause flooding.
- **Public Service of Wallonia (SPW) - Hydrological Management** regional institution monitoring water levels, managing water infrastructure such as dams and reservoirs and evaluating flood risks using weather data from the IRM.
- **Regional Crisis Centre of Wallonia (CRC-W)**: leads crisis management efforts at the regional level by coordinating responses and sharing information among regional services, local authorities and emergency responders during flood emergencies.

- **Local Municipal Authorities, Civil Protection and Emergency Services, Dam Operators, Federal Public Service, Scientific Research Institutions, etc.**

Additionally, various frameworks and management plans help in emergency response and flood prevention. The **decree on crisis management and emergency plans** outlines responsibilities for crisis management in Wallonia. The **general emergency and intervention plan (PGUI)** guides emergency management at the regional level, including flood-specific plans. And **PLUIES Plan** is an action plan to improve rainwater management and flood prevention.

BELGIUM, JULY 2021: CHRONOLOGICAL OVERVIEW OF THE FLOOD CRISIS MANAGEMENT (BECKERS, 2022)

1. Initial Weather Alert – July 12, 2021

The IRM issued a warning regarding extreme rainfall, forecasting up to 150 mm in certain regions – an amount equal to what typically falls over two months within a period of just two days. A yellow alert was announced at 12:14 PM calling for the activation of emergency procedures. However, not all involved stakeholders shared and understood this alert.

2. Hydrological Analysis

Various institutions – the IRM, the public Service of Wallonia's hydrological services, engineers from the energy company Engie, regional authorities responsible for ensuring a stable water supply – analysed the weather forecasts to assess flood risks. The IRM provided weather data, while the hydrological services of Wallonia were responsible for interpreting this data to predict the impact on water levels and issue flood warnings. However, the different interpretations, among these entities resulted in inconsistent responses. The engineers at the Robertville dam chose to lower the dams water level in anticipation of rainfall whereas the management of the Eupen dam initially did not implement such precautionary steps, which ultimately worsened the flooding.

3. Communication and coordination

There was a lack of communication, between federal (IRM) and regional (hydrological services), worsened by the division of responsibilities across various government levels. Vital information was not adequately exchanged among the services resulting in delayed reactions.

4. Crisis response – July 14th 2021

Once the rain began, people realized the seriousness of the situation. By then it was already too late to prevent the devastating consequences. Crucial choices had to be made like deciding to open the gates of the Eupen dam which ended up worsening the severity of the floods.

Table 1: Positive and negative aspects of the flood crisis management

POSITIVE ASPECTS	NEGATIVE ASPECTS
• **Proactive local actions**: Robertville Dam's partial release helped mitigate disaster impacts. • **Rapid awareness**: Quick action once the severity was recognized, including population alerts and resource mobilization.	• **Alert system and coordination**: The lack of a cohesive, intergovernmental approach to crisis management (coordination and communication between federal and regional institutions) delayed actions. • **Inconsistent dam management**: Decisions were made in isolation and conflicting, worsening the situation. • **Lack of preparedness**: The system was unprepared for such extreme rainfall, despite forecasts.

4.2 LINK WITH CLIMATE CHANGE

A research study carried out jointly by the World Weather Attribution (WWA) and experts from the Royal Meteorological Institute (IRM) has brought attention to how climate change is affecting the frequency of weather patterns. The amount of rainfall observed in the Meuse basin has exceeded usual levels. The results suggest that a global temperature increase of 1.2°C since the industrial revolution has raised the chances and strength of these rainfall incidents from 3% to 19%. It is however highlighted that attributing extreme rainfall events to climate change is extremely difficult in small regions like the Meuse basin. To obtain reliable results, the study extended its analysis to a broader region, including parts of Germany, France, the Netherlands, Luxembourg, and Switzerland. The conclusion is a warning signal that if global temperatures continue to rise, the probability and intensity of such extreme rainfall events will increase. This conclusion aligns with the findings of the latest Intergovernmental Panel on Climate Change (IPCC) report, showing the urgent need for climate action (Tradowsky, J.S., Philip, S.Y., Kreienkamp, F. et al., 2023).

5 TOURISM DEVELOPMENT IN WALLONIA

5.1 BACKGROUND INFORMATION

Wallonia has a well-defined concentration of tourist hubs, which offer attractions and/or accommodations. Figure 10 represents the spatial density of tourism businesses (attraction and accommodation) and translates into an estimated density of tourism per day/resident. We can see that tourism in Wallonia is spatially concentrated in valleys, towns, and nature reserves, with key areas offering a mix of historical, cultural, and natural attractions. The intensity of tourism changes across areas, with some regions focusing more on accommodations and others on attractions.

Some key areas are:

- **The Ourthe Valley** which is a centre for both nature-based activities and small towns.
- **Pairi Daiza**: Belgium's most famous zoo attracting thousands of visitors daily.
- **Spa and the natural reserve "Hautes Fagnes"** offer possibilities for tourists interested in hiking, nature, and wellness with the town of Spa known for its thermal baths.
- **The Amblève Valley** focused on natural attractions like waterfalls, caves, and hiking trails.
- **Bouillon and the Semois Valley**: While the town of Bouillon attracts tourist with its medieval castle and its rich history, the river Semois, offers opportunities for outdoor and water activities.
- **Bastogne**: Important city during World War II and is a key historical tourism destination.
- **Han-sur-Lesse and Rochefort**: Towns located near the Lesse River that are famous for their caves (Grottes de Han) and wildlife park.
- **Dinant and Namur**: Situated along the Meuse River, they are popular destinations for day trips and river cruises.

In addition to these major hubs, there are many smaller, rural tourist areas that focus more on local accommodations, such as rural lodgings and secondary homes.

Wallonia accounts for a lot of national parks which do not especially appear as tourism hubs in the map below, for the reason that there is no accommodation nor built tourism attractions. To have a representative idea of the tourism density in those natural areas, the Conférence Permanente du

Développement Territorial (CPDT) collected mobile data. The results show that there are highly visited natural areas, like the Hautes Fagnes plateau and the Anlier Forest that do not appear as tourism host spots because they are more likely visited by day trippers. They should however not be forgotten as key tourism areas (CPDT et al., 2021)

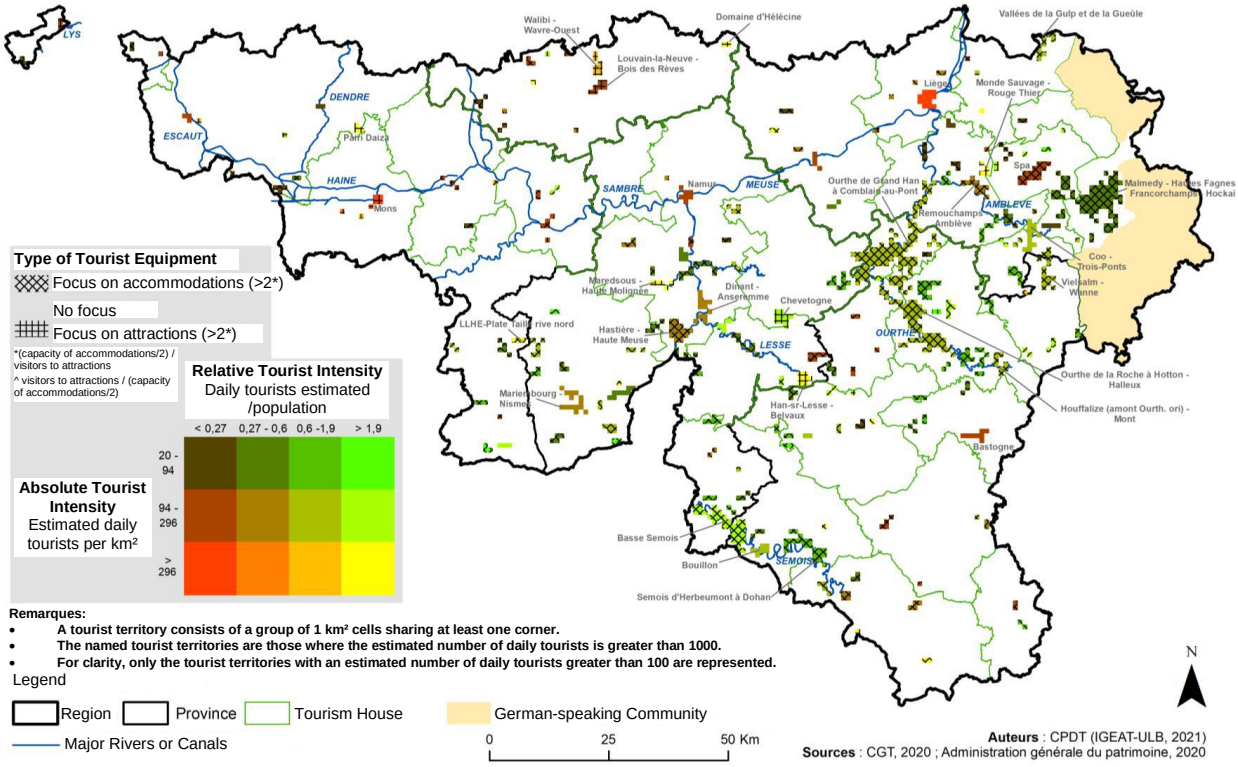


Figure 10: Typology of tourist territories based on recorded attractions and accommodations in Wallonia (CPDT et al., 2021)

5.2 TOURISM GOVERNANCE

Tourism in Belgium is managed at the regional level. In Wallonia, the tourism sector is a complex network of collaborations, strategic partnerships, and governance involving both public and private entities. The Commissariat Général au Tourisme (CGT) is the central administrative body which is divided in 5 departments that are all responsible for a specific area (tourism organizations, attractions, accommodations, and strategic development). It operates under the strategic orientation provided by the Ministry for Public Service, Tourism, Heritage, and Road Safety and aligns with broader laws gathered in the "Walloon Tourism Code" and the "Walloon Political Declaration". The CGT collaborates closely with VISITWallonia which is responsible for marketing

and promotion through public-private partnerships, involving members from both the public and private sectors. Strategic partnerships also extend to international and regional bodies like UNWTO, EUC. Additionally, the CGT and VISITWallonia give support and guidance, on various daily issues, to tourism-related businesses, including hotel industries, catering, transportation services, and attractions (VISITWallonia, n.d.) and (CGT, n.d.).

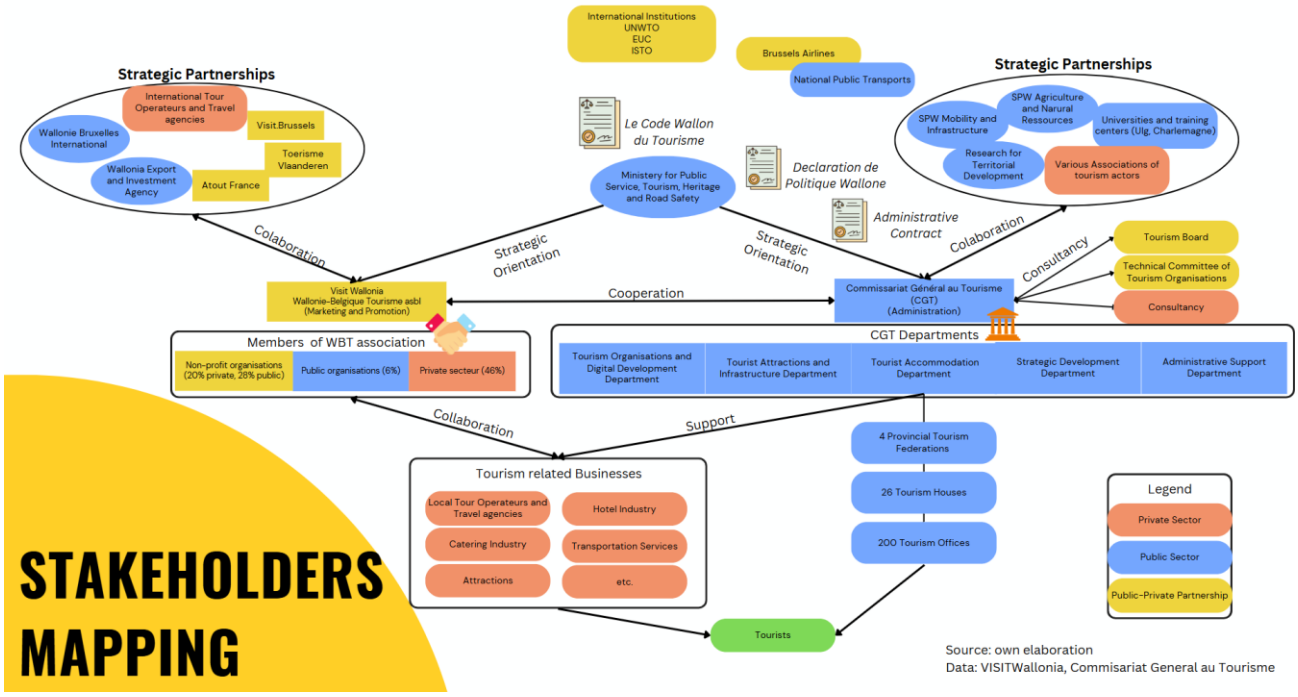


Figure 11: Stakeholders's mapping - Wallonia Tourism Sector (own elaboration – Data: VISITWallonia & CGT(n.d.))

Since October 2021, the CGT is implementing the new tourism strategy for 2030 that aims to highlight Wallonia as a top destination by enhancing its cultural heritage, promoting eco-friendly tourism practices and boosting the economy through strategic investments in infrastructure and marketing efforts, especially in nature-based tourism and cultural activities (CGT & Wallonie Belgique Tourisme, 2021). As a complement to this, the 2025 Digital Strategy for Wallonia's tourism seeks to enhance visitor's experiences by providing a "phygital" journey which blends physical and digital interactions (KPMG and VISITWallonia, 2021).

5.3 TOURISM GROWTH

The tourism industry in Wallonia, like in other European regions has always been a contributor to the local economy. With its diverse landscapes, rich cultural heritage and close access to major European cities, Wallonia has become a popular destination for both national and international visitors with neighbouring countries such as France, The Netherlands and Germany bringing the main inbound tourism. However, the beginning of the COVID 19 pandemic in 2020 marked by the series of lockdowns, travel restrictions and health issues contributed to a drop in tourist arrivals and overnight stays (Statbel, 2024).

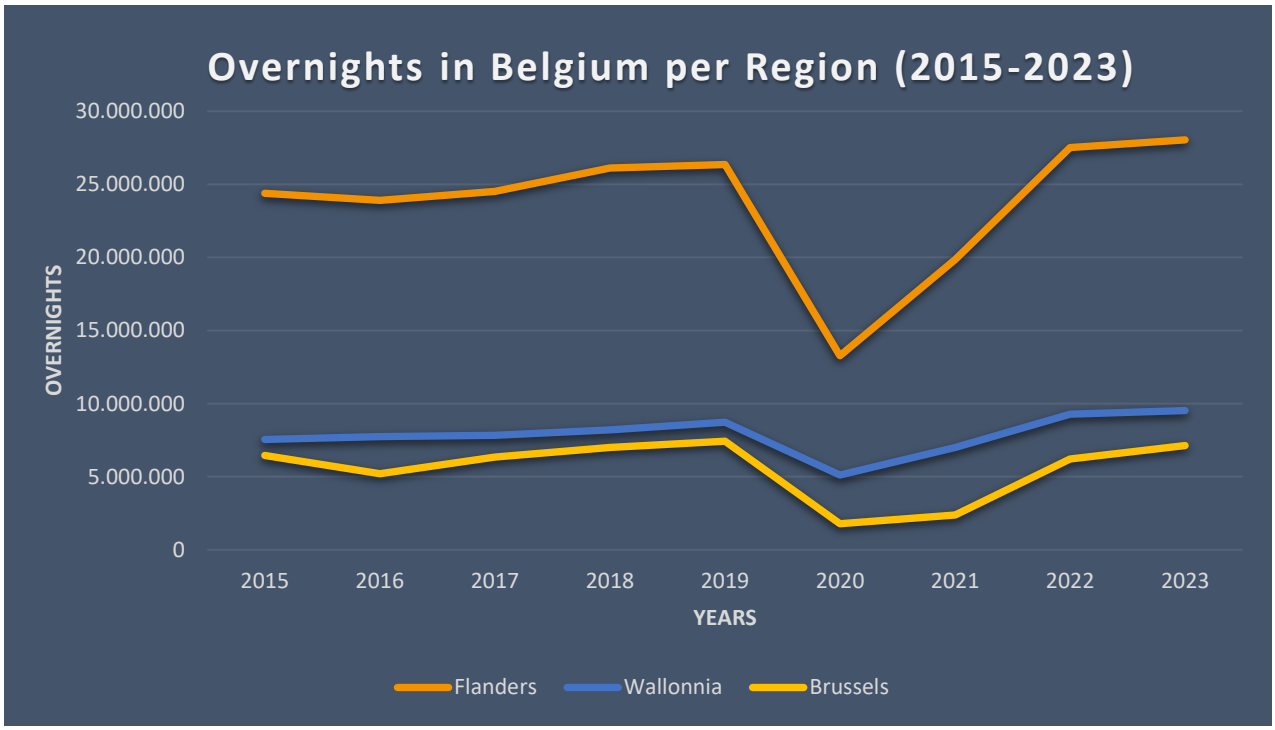


Figure 12: Overnight in Belgium per region (2015 - 2023). Own elaboration. Data: Statbel (2024)

Graph 13 shows the high seasonality occurring within Wallonia's tourism sector which plays a critical role on visitor flows and economic performance throughout the year. The seasonality aligns with the typical summer vacation patterns in Europe with the highest tourism activity occurring in July and August, with respectively 1,314,560 and 1.291.421 overnight stays. And the lowest activity are observed in January and February, with respectively 334,368 and 399.374 overnight stays for the year 2019. When calculating the coefficient of variation (CV), which is a statistical measure that

expresses the extent of variability in relation to the mean of the data (Tomori, 2023), we observe the followings:

- The highest coefficient of variation (1,0112) in 2020 translates the extreme disruptions caused by the COVID-19 pandemic, with some months close to zero tourism activity due to lockdowns.
- The lowest coefficient (0,4250) in 2019 which indicates variations within a normal range, reflecting consistent and predictable tourist behaviour.

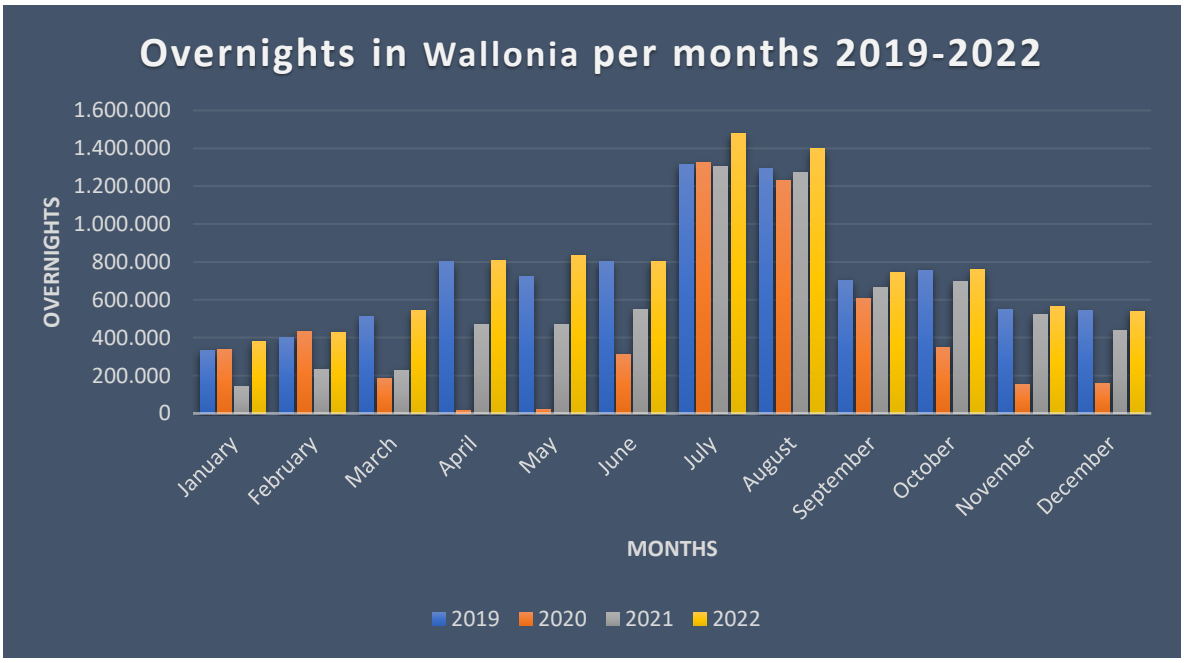


Figure 13: Overnights in Wallonia per months (2019 - 2022). Own elaboration. Data: Statbel (2024)

Figure 14 represents the number of visitors in touristic attractions for the period 2004-2022 focusing on three main types of attractions in Wallonia (cultural, natural, and recreational). Cultural attractions encompass historic sites, castles and museums. Natural attractions refer to caves, parcs, reserves and zoos. Recreational englobes nautical activities, theme parks and adventure parks (CGT, 2020). While natural and recreational attractions show a relatively steady growth, cultural attractions experience a more nuanced evolution. Several peaks can be observed in 2009, 2015 and 2019 for each type, coinciding with heatwaves in the region and especially in the summer months. These peaks can be attributed to a surge in visits to indoor, water-based, and shaded

attractions that provided relief from the extreme heat. Visitors often are looking for cool environments such as museums or water-based recreational activities, leading to an overall rise in attendance during these periods. Heatwaves and more decent climate in Belgium also lead to a change in tourism behaviour increasing staycations and national tourism, where locals choose to visit nearby attractions instead of traveling to neighbouring countries (that usually offered more pleasant climate). The years 2019 and 2020 affected by the COVID-19 pandemic led to an unprecedented drop in visitor numbers across all types of attractions. Cultural and recreational attractions were particularly hit hard, with visitor numbers dropping to almost 1.5 million. Natural attractions also experienced steep declines due to lockdowns and restrictions on movement. There was a slight increase in visits to natural attractions as people looked for outdoor activities that allowed for social distancing. However, the overall visitor numbers remained significantly below pre-pandemic levels. The year 2021 shows the recovery of the tourism industry from the pandemic with a strong increase in visitors' numbers. However, the recreational pole still experienced stagnation that can be explained by the flood of July 2021 that caused temporary closures of 47 attractions, especially the one located closed to water beds in the provinces of Liège, Luxembourg, and Namur. This resulted in an estimated loss of 620,000 visitors compared to recovery prediction (Parent, 2023).

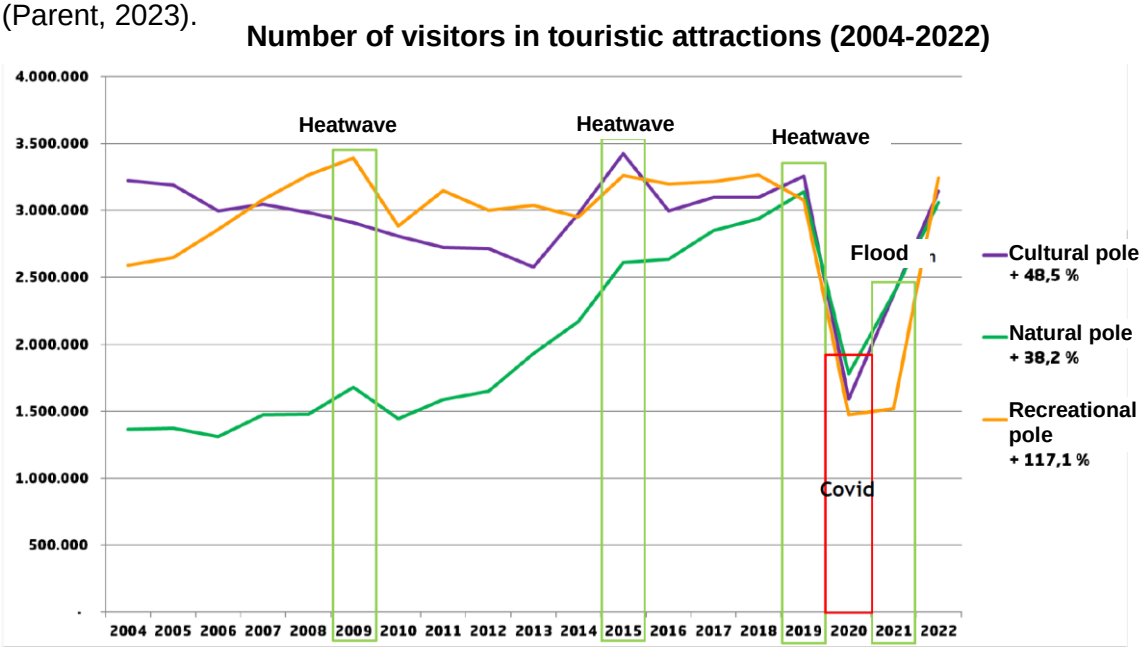


Figure 14: Number of visitors in touristic attractions (2004-2022). Attraction et Tourisme (Parent, 2023)

5.4 SOCIAL AND ECONOMIC DEVELOPMENT

The following section will provide a comprehensive overview of the economic contributions and social impact of the tourism sector, exploring key factors such as revenue generation, gross value added, employment, entrepreneurial activity and the economic weight of tourist attractions.

5.4.1 REVENUE GENERATION

In 2019, the tourism sector in Wallonia was in good health, contributing approximately €6.25 billion to the local economy and supporting around 84,000 jobs (CGT, 2020). However, the pandemic in 2020 led to a decline in revenue, dropping to €4.13 billion and resulting in job losses (CGT, 2021). The year 2022 is significant for an increase up to €7.06 billion and rise in job creation (CGT, 2023). In a CGT report analysing tourism revenue from 2019 to 2022, this fluctuation is further reflected with a detailed methodology that captures the economic weight of the tourism sector through both broad and restricted definitions. The restricted definition focuses on core tourism activities while the broad definition also includes related sectors such as accommodation, food and transportation. Figure 15, shows those variations. In 2019, the broad definition peaked at €6.25 billion but dropped to €4.13 billion in 2020. Similarly, the restricted definition, showed a decline from €2.42 billion in 2019 to €1.40 billion in 2020. Despite these challenges, the sector began to recover in 2021, with revenues going up to €5.22 billion (broad) and €1.99 billion (restricted). By 2022, the tourism sector not only recovered but exceeded its pre-pandemic levels (CGT & IWEPS, 2023).

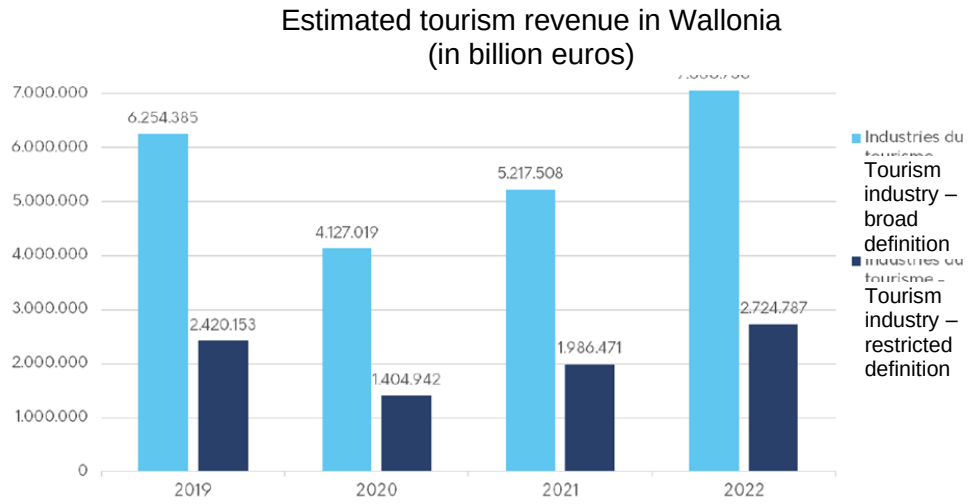


Figure 15: Estimated tourism revenue in Wallonia (in billion euros) (CGT & IWEPS, 2023)

However, figure 16, shows the significant gap between the expected revenue for the years 2020 and 2021 (restricted), which was projected to be respectively €2.570 billion and €2.694 billion as the sector continued on its pre-pandemic growth trajectory. The estimated loss of revenue due to these disruptions is €708 million in 2021, which represents a 26% shortfall relative to the expected revenue. This was still an improvement compared to 2020, where the revenue loss was €1.165 billion, indicating that while the sector was beginning to recover from COVID-19, it was still heavily impacted by external factors such as the flood (CGT, 2022).

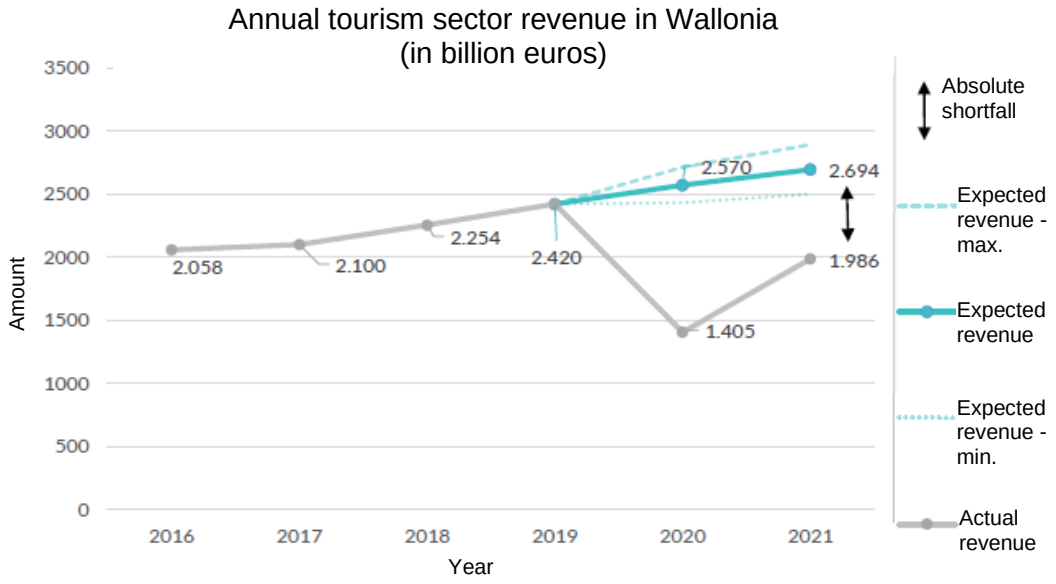


Figure 16: Annual tourism sector revenue in Wallonia (in billion euros) 2016 – 2021 (CGT, 2022)

Another interesting data to take into consideration is the variation of the various tourism sub-sectors to Wallonia's total tourism revenue from 2019 to 2022 represented in figure 17. In 2019, domestic tourism was the largest contributor with 46%, followed by outbound tourism at 27%. The impact of the COVID-19 pandemic in 2020 significantly increased the share of domestic tourism up to 53%, as outbound tourism dropped sharply to 16%. In 2021, domestic tourism still maintained a high share of 54%. By 2022, the sector had begun to stabilize, with domestic tourism decreasing slightly to 47% and outbound tourism recovering to 26%, reflecting a gradual return to pre-pandemic patterns (CGT & IWEPS, 2023).

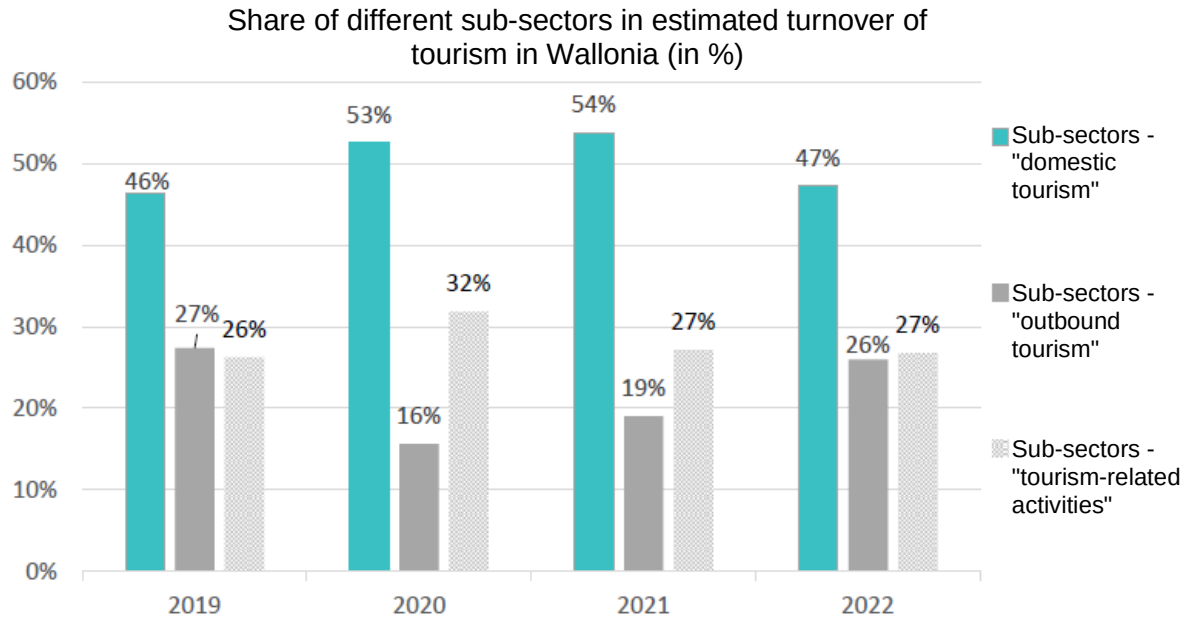


Figure 17: Share of different sub-sectors in estimated turnover of tourism in Wallonia (in %) (CGT & IWEPS, 2023)

5.4.2 GROSS VALUE ADDED (GVA)

In 2021, the tourism sector in Wallonia, while recovering from the impacts of the COVID-19 pandemic, contributed 3.66% to the region's total Gross Value Added (GVA) under a broad definition, with a more restricted definition showing a contribution of 1.30%. This marks a partial rebound from 2020 when the sector's GVA had dropped to respectively 3.16% and 1.08%, due to the pandemic's severe effects on hospitality and leisure activities (CGT, 2023). However, when compared to other sectors, the tourism recovery appears slow. The manufacturing sector, an essential pilar of Wallonia's economy, experienced a strong recovery with an 8.5% increase in GVA, driven largely by demand in intermediate goods and the revitalization of global supply chains. Similarly, the construction sector, which had suffered significant difficulties in 2020, saw an 8.1% growth in GVA in 2021, reflecting a strong rebound in both residential and infrastructure projects. Additionally, the commercial services sector, which includes critical areas like transport and communication, recorded a 7.1% increase in GVA, rebounding from the heavy pandemic declines. This sector's performance, together with manufacturing and construction, highlights their pivotal roles in the regional economy, with their GVA contributions far surpassing the one of tourism during the recovery period. Overall, tourism remains an important sector and is heavily dependent on

other sectors. The fast rebounds seen in manufacturing, construction, and commercial services was key drivers in the recovery of the tourism industry (Wallonie economie SPW et al., 2022).

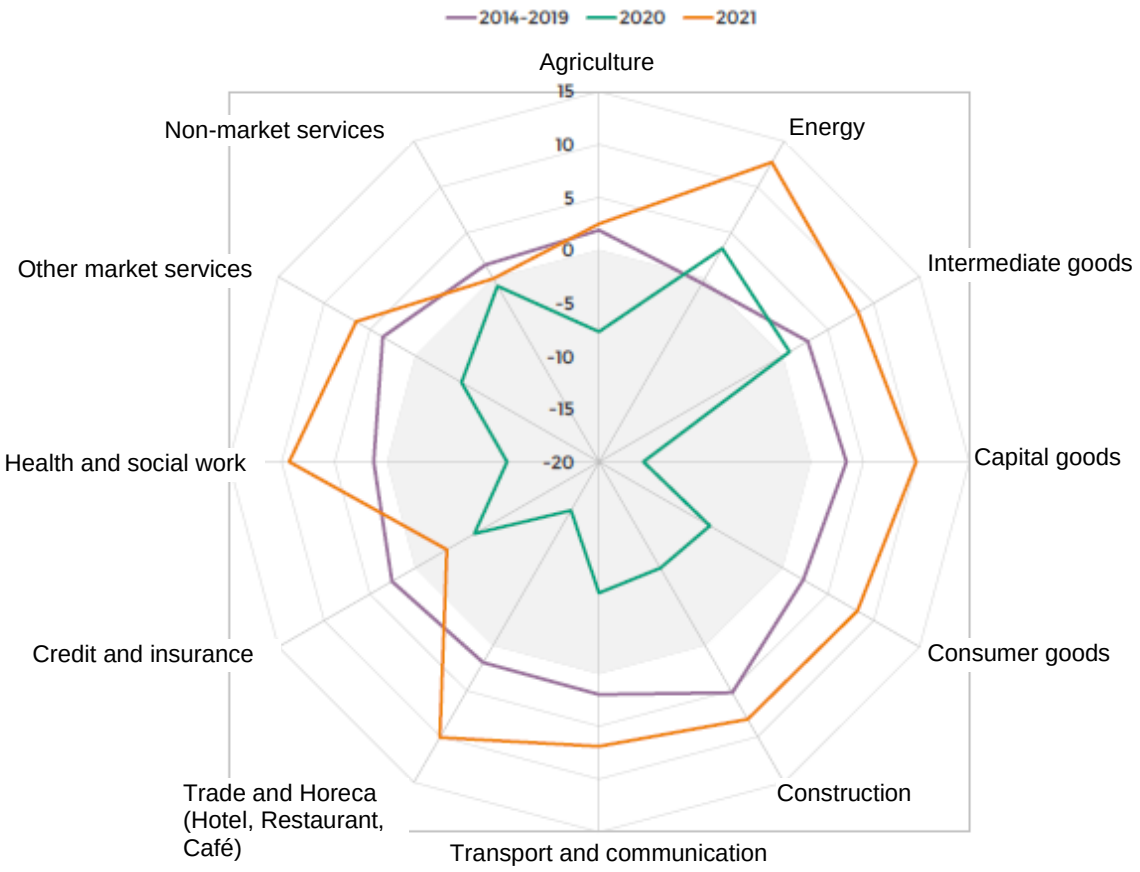


Figure 18: Growth of GVA in wallonia for each sector 2014-2021 in % (Wallonie economie SPW et al., 2022)

5.4.3 EMPLOYMENT

The tourism sector in Wallonia has become one of the major employers in the region, with jobs spread across various sub-sectors including accommodation, food services, cultural attractions, recreational activities, etc. The largest share of employment was, in 2019, in accommodation and food services, reflecting the high demand for these services by both domestic and international tourists (CGT, 2020). However, the sector experienced significant fluctuations in employment levels between 2019 and 2022. In 2019, the tourism sector provided approximately 84,000 jobs, equating to around 59,000 full-time positions, which represented 7.5% of Wallonia's total workforce (CGT, 2022). Under the broad definition, the sector supported 61,818 salaried positions, while the restricted definition accounted for 17,936 jobs (CGT & IWEPS, 2023). In 2020, the pandemic led

to a sharp decline in employment, with the number of salaried positions falling to 58,754 (broad) and 17,092 (restricted), reflecting the widespread impact of COVID-19 across the sector. Many workers faced reduced hours or job losses as businesses, especially small and medium-sized enterprises, struggled to survive. Despite these challenges, a slight recovery was observed in 2021, with employment figures rising to 58,740 (broad) and 17,296 (restricted), illustrating the sector's gradual stabilization (CGT, 2023).

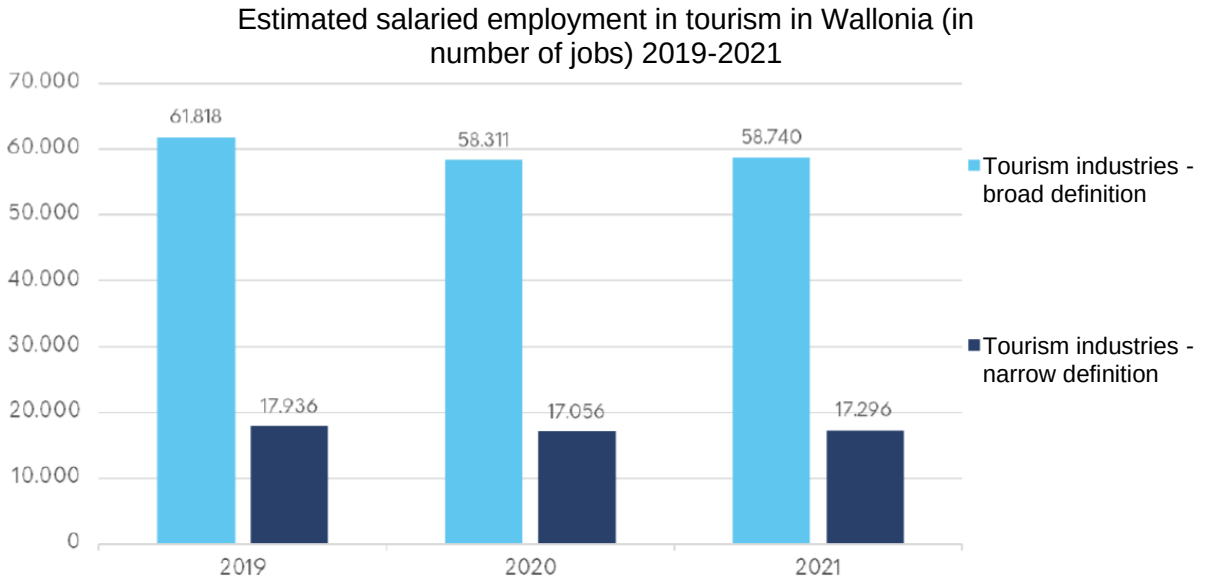


Figure 19: Estimated salaried employment in tourism in Wallonia (in number of jobs) 2019-2021 (CGT, 2023)

5.4.4 ENTREPRENEURIAL ACTIVITY

Figure 20 shows how businesses in Wallonia's tourism industry evolved from 2019 to 2022. The net creation rate of business has been consistently increasing since 2019 with a surge in 2022 reaching 6%, signalling a notable increase in the sector activity. The highest growth was seen in the domestic tourism sub-sector reflecting ongoing confidence and investment. In 2021 the entrepreneurial dynamism index stood at 1.65, indicating that for every 10 businesses that closed down around 16.5 new ones were launched, showing a recovery and the sectors ability to stimulate business activities despite recent challenges. This upward trajectory in business creation rates stimulated by an increase in startups rather than a decrease in closures highlights the thriving entrepreneurial spirit within the sector. Particularly important to point out is the remarkable creation

rate of 10.76% observed in 2022 signalling a phase of recovery and expansion (CGT & IWEPS, 2023).

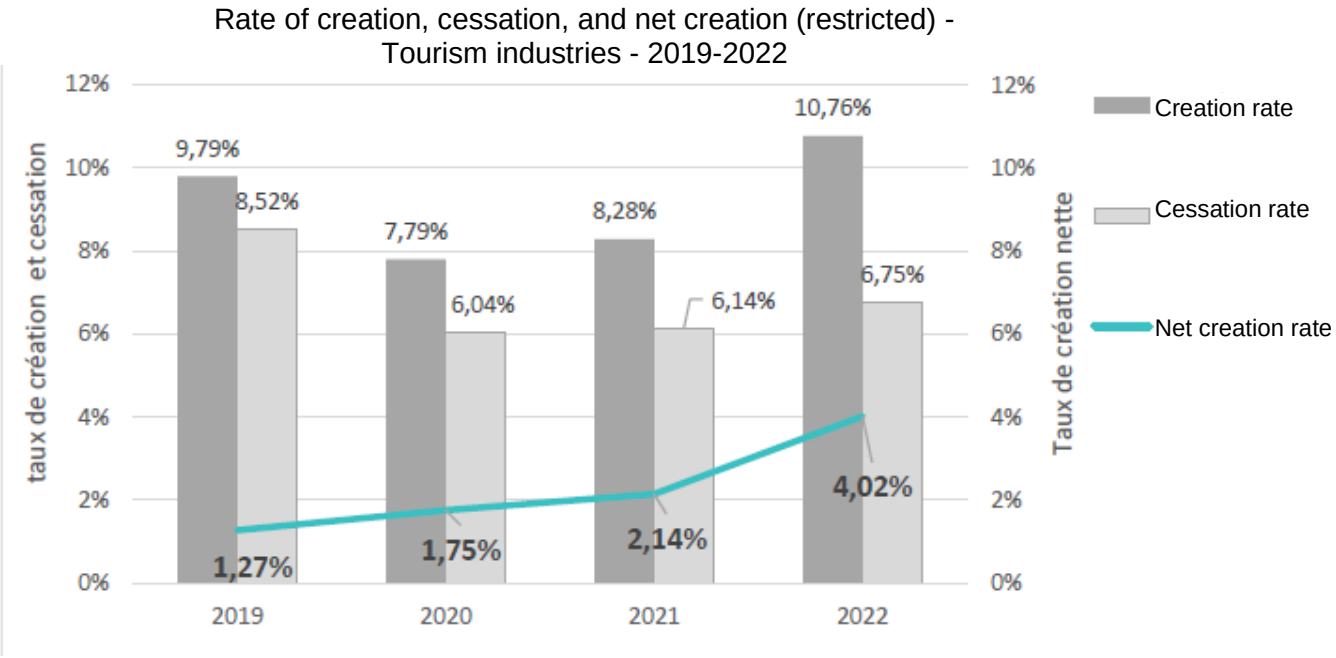


Figure 20: Rate of creation, cessation, and net creation (restricted) - Tourism industries - 2019-2022 (CGT & IWEPS, 2023)

5.4.5 ECONOMIC WEIGHT OF TOURIST ATTRACTIONS AND MUSEUMS

Tourist attractions and museums represent a significant component of Wallonia's tourism sector, with their economic performance offering key insights into the sector's health. From 2014 to 2019, the revenue generated by these attractions steadily increased from €103 million to €172 million, reflecting robust growth. However, the pandemic caused a sharp decline to €104 million in 2020, before partially recovering to €134 million in 2021.Revenue per visitor in 2021 was €28.66, indicating a strategic shift towards attracting higher-spending visitors to compensate for lower overall tourist numbers. In terms of revenue distribution by sector, 64% came from visits, 7% from retail (boutiques), 23% from HoReCa (hotels, restaurants, cafes), and 6% from rentals and other services. We also observe the natural pole being the most important source of revenue with 67% (CGT, 2023).

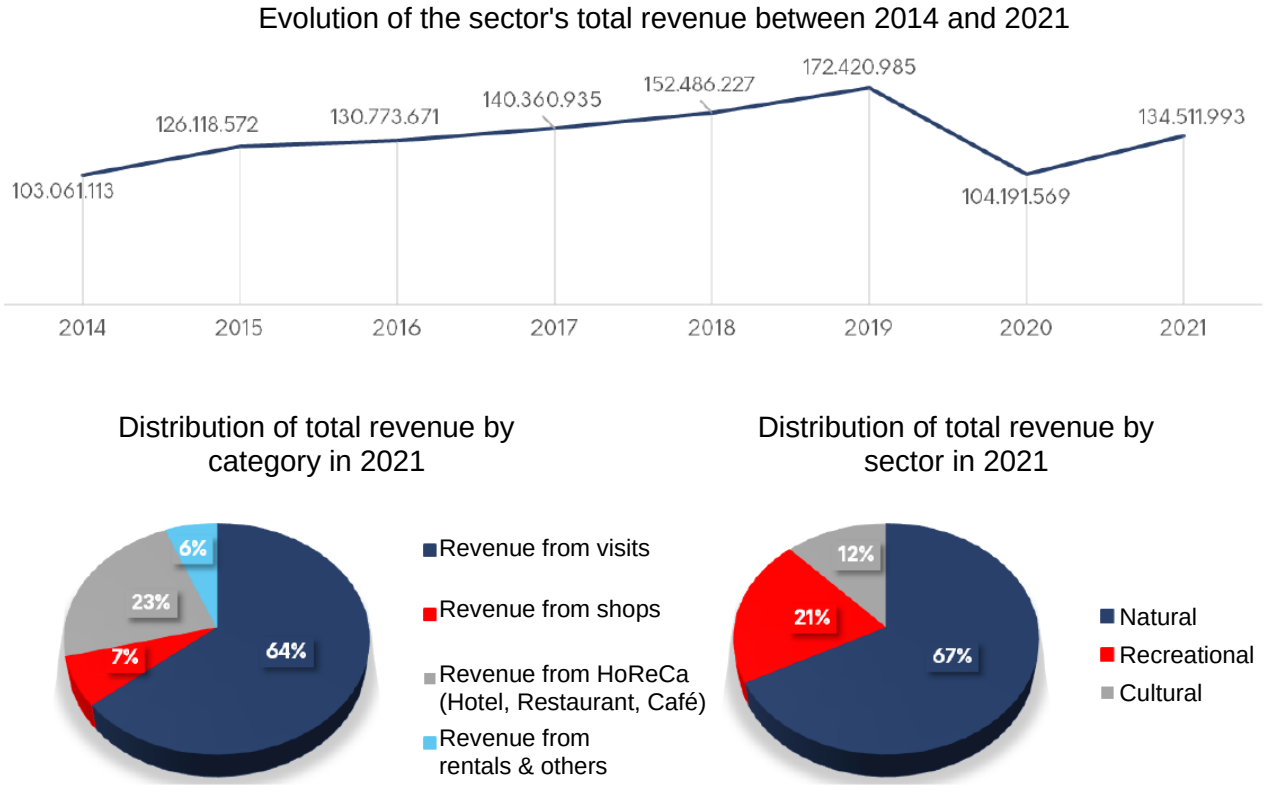


Figure 21: Evolution of the sector's total revenue between 2014 and 2021 (CGT, 2023)

5.4.6 INVESTMENT AND GOVERNMENT SUPPORT

The Walloon government introduced a variety of support measures to help the tourism sector cope with the impact of the COVID 19 pandemic. Financial assistance programs were provided to a range of tourism related businesses, such as accommodation, restaurants, travel agencies and other service providers. The goal of these actions was to maintain job opportunities, prevent business shutdowns and help in the sectors recovery. The government also implemented strategies to support tourism and reduce reliance on international markets which was hit hard by the pandemic. They promoted local attractions, improved infrastructure and assisted tourism businesses in meeting health and safety requirements as an attempt to boost domestic tourism and prepare the industry's recovery (Wallonie économie SPW et al., 2022).

From that year, the tourism industry investment landscape saw significant changes. Despite facing obstacles, there was an increase in business formations within the tourism sector especially in 2022. This increase in entrepreneurial activity was mainly fuelled by a growing belief in the sectors opportunities supported by investments from both private and public sources. The government

played a big role by offering investment incentives, motivating entrepreneurs to start new businesses or grow their existing ones (CGT, 2023).

The 2021 Walloon Recovery Plan aimed to help the region's economy recover from the pandemic by making investments in various areas such as supporting current tourism businesses and boosting new investments to enhance resilience against future events. A key focus was on funding innovation for tourism services and assisting in digital transformation and marketing strategies to attract both national and international tourists to Wallonia. The emphasis on sustainability is evident, with subsidies allocated towards enhancing energy efficiency in tourism establishments, preserving cultural heritage sites and fostering the growth of rural and ecotourism accommodations. The Walloon Recovery Plan was ready to be launched when the flood came. When the disaster struck, they directly decided to allocate a portion of the investment into the reconstruction of flood affected areas (Gouvernement wallon, 2019).

In response to the 2021 floods, the Walloon government provided financial aid to tourism enterprises impacted by the disaster. The support package encompassed subsidies for reconstructing and renovating properties along with designated funds to facilitate the recovery of the tourism industry, in the most affected region. In the aftermath, the CGT immediately started to evaluate the impact on tourism operators and manage urgent funding requests. The assistance included offering support for replacing equipment that was no longer functional. The CGT also focused on informing visitors about the attractions and services that were still accessible which helped to keep some level of tourism activity in the affected areas (CGT, 2022).

Additionally, in a proactive measure to mitigate future risks, the Minister of Tourism launched a specific project targeting campgrounds at high risk of flooding. This initiative aimed to support camp sites in transitioning their businesses to safer and more sustainable models. A maximum subsidy of €200,000 was provided, covering 80% of the costs, and 20 campground projects were approved for funding (CGT, 2023).

In addition, the CPDT scientific report (2021), highlights the significant investments that were made in infrastructure in a way to boost the sector. It encompasses investments in eco-friendly tourism

infrastructure, natural areas (parks and reserve) and digitalisation. Public-private partnerships have also been instrumental in the restoration of key tourist attractions and accommodations, and in making sure they match tourists changing preferences (Conférence Permanente du Développement Territorial (CPDT) et al., 2021).

5.4.7 MARKETING AND POSITIONING

After facing the challenges of the COVID 19 pandemic and the destructive floods in 2021 Wallonie Belgique Tourisme (WBT) went through a comprehensive rebranding phase, becoming VISITWallonia in 2022. This rebranding was a part of their strategic plan to position Wallonia as a resilient and attractive destination.

The launched VISITWallonia brand has been focusing on boosting its visibility and engagement through marketing initiatives on different platforms with a key focus on a specific demographic (target group between 25 and 35 years old). Additionally, highlighting seasonal tourism products to attract in a wide range of visitors as part of the strategy. An example of this is the "Color your Winter" campaign which was strategically timed to support tourism activities by showcasing the accessibility and safety measures, in the COVID-19 recovery phase while also advocating for sustainable tourism practices. A key element of this strategy was the emphasizes on four-season sustainability, positioning Wallonia as a destination for all seasons to spread out visitor traffic and minimize effects (VISITWallonia, 2023).

WBTs focus on sustainability played a role in the destination’s recovery by encouraging eco-friendly initiatives, supporting local producers while also launching a Sustainable Tourism Charter to promote sustainable tourism practices in the area. The combination of floods and the pandemic also accelerated WBT’s transformation journey and resulted in substantial investments in the Regional Commercialization Tool (ORC). This technology helps local tourism businesses improve their digital presence, manage online bookings, and interact better with potential travellers. It allows them to handle reservations more efficiently and decrease their dependence on physical facilities and external platforms (VISITWallonia, 2022).

Public-private collaborations were also crucial in WBT's recovery support. They initiated local businesses, municipalities, and tourism operators to work together on marketing and promotional campaigns aimed at boosting Wallonia's appeal as a tourist hotspot. VISITWallonia further developed these partnerships in 2022 by integrating more stakeholders in both promotional and operational aspects of tourism growth initiatives. These collaborative efforts played a role in revitalizing the region by combining resources effectively, coordinating marketing strategies and sharing knowledge. The ORC initiative has also played a role in assisting tourism businesses in shifting towards online sales and marketing (VISITWallonia, 2023).

5.5 SUSTAINABLE TOURISM DEVELOPMENT

5.5.1 TRAVELLERS'S BEHAVIOURS

Many studies show that tourists in Belgium and Europe are increasingly interested in sustainable tourism. However, there are still noticeable disparities between what they intend to do and what they actually do in practice according to a report by Atout France (2009), with only a portion of the population willing to pay extra for eco-friendly choices. The report emphasizes the value placed upon sustainability labels but recognize a lack of awareness among consumers. The Eurobarometer 2015 also shows that more than half of European travellers didn't take environmental aspects into account when selecting their travel destination. Only a small percentage (17%) considered sustainable practices once at the destination. Additionally, only 10% of the interviewees said they are influenced by sustainability certifications (European Commission, 2016).

The 2021 Eurobarometer report focusing on Belgium points out that although sustainable tourism has gained interest in the country; Belgian travellers tend to show less enthusiasm compared to the average European towards embracing eco-friendly behaviours and choices. To illustrate further; 28% of Belgians are willing to consume local products compared to 55% EU wide and 21% are open to paying extra for environmental conservation efforts compared to 35% EU wide. EU citizens, mainly select travel destinations based on cultural experiences (44%) trip cost (43%) and natural environment (43%). Although 82% of people are open to changing their travel behaviours

for sustainable reasons, many individuals face challenges in accessing information about sustainable travel choices like carbon emissions from transportation and certifications for eco-friendly accommodations (European Commission, 2021). Over the decades there has been a clear increase in awareness and implementation of sustainability initiatives. However, there is still opportunity for enhancement. It is important to align sustainable products and services with consumer preferences and educate individuals about the significance and advantages of opting for sustainable choices.

5.5.2 SOCIAL REPRESENATION

A recent survey carried out in Wallonia in 2021 among accommodation providers, tourism students, sector professionals, tourism stakeholders in natural parcs and public stakeholders analysed the social representation of sustainable tourism. It is an interesting angle to begin with as the way in which a person represents a subject influences the actions he or she will take in relation to that subject. Social representations open up or close down possibilities for action (Abric, 2005).

The study revealed that the majority of the students interviewed associate sustainable tourism with nature, local products, interaction with locals and eco gestures, while public stakeholders put the accent on the limitation of tourists and impact proportionality. Those results already reveal the complexity of the topic and the unclear definition of sustainability. The study pushes the analysis further and explores the long-term tourism challenges as perceived by professionals. Social media, high energy costs and shared economy businesses such as Airbnb are perceived as the biggest challenges. Challenges linked to CO^2 emissions, water sanitation, biodiversity lost, climate change phenomena, and tourist mobility have a more nuanced importance. To understand the extent of involvement of tourism stakeholders (both public and private) in the green transition, a follow-up question is asked to determine why most investments are not made. The findings indicate that the lack of investment in response to the challenges is primarily due to a lack of interest. Private actors also point out the lack of support from the public institutions in this transition (De Beer De Laer & De Myttenaere, 2023).

5.5.3 GOVERNANCE FRAMEWORKS

Various strategies and initiatives are contributing to Wallonia's economic growth while also focusing on sustainable development efforts within the region. The substantial financial aid from the Wallon recovery plan significantly boosted the economy and supported sustainable practices. While the Tourism Strategy for 2030 serves as a guideline for promoting sustainable tourism development, other regional strategies are starting to develop with a more local focus.

For instance, the Province of Liège has adopted a collaborative approach towards eco-tourism with guidance from the Tourism Fédération of the Province of Liège. This strategy was launched in 2022 and entails strong collaboration with local tourism businesses and stakeholders to establish a sustainable tourism framework. The emphasis is on sustainability and eco consciousness, with a goal to make tourism inclusive for everyone by improving transportation options and incorporating natural spaces as key aspects of the region's tourism identity. Creating a program to train professionals is a priority initiative along with promoting local heritage through geocaching activities and cross-border collaboration. This involves conducting workshops and seeking feedback from various stakeholders to ensure actions are tailored to local requirements and in line, with wider environmental and economic objectives (Fédération du Tourisme de la Province de Liège, 2022).

In addition to sustainably frameworks, the CGT has developed an new approach to digitalisation, which includes the creation of PIVOT, a shared database and platform that connects public authorities with tourism operators and organisations. This platform enhances collaboration and data sharing across the sector. The CGT also offers free audits to assess stakeholders' digital engagement, followed by tailored workshops to help them address any gaps identified. Furthermore, stakeholders benefit from open access to online tools aimed at fostering development and enhancing marketing efforts. In terms of skills development, the CGT actively engages stakeholders through workshops and networking events designed for tourism professionals. It offers a comprehensive range of specific training programs, aimed at building the capacities of workers within the tourism sector (CGT, n.d.)

In 2024 the Walloon Tourism Council emphasized the need for defined and consistent governance framework to promote sustainable tourism practices effectively in the region. Walloon authorities are advised to implement regulations aimed at maintaining the competitiveness and long-term sustainability of the tourism industry. This involves creating guidelines and handbooks for tourism businesses to assist them in integrating sustainable approaches into their day-to-day operations. The Council also urges enhancements in the accessibility of tourist attractions in rural areas and improvement of public transportation. Additionally, they emphasize the need to tackle the effects of climate change on tourism infrastructure (Conseil du Tourisme Wallon, 2024).

5.5.4 SUSTAINABLE TOURISM INITIATIVES

In 2017, a report published by Wallonia Inter-Environment Federation, focuses on sustainable tourism in Wallonia and presents it as an opportunity for the development of the region. They present a situation analysis of the various initiatives implemented, so far, by the CGT, to promote sustainable tourism. These include the *Wallonie Destination Qualité* program aimed at enhancing the quality and sustainability of tourism services, support for the *Green Key* eco-label and *Bienvenue Vélo* label, which promote eco-friendly practices in accommodations and bike-friendly services, respectively. The *RAVeL* plan focuses on developing cycling routes to boost long-distance cycling tourism. Additionally, the CGT organized the *European Destinations of Excellence* (EDEN) competition to highlight sustainable tourism practices in lesser-known areas.

In the private sector, the Wallonia Natural Parks Federations engages in sustainable tourism through the creation of hiking trails and the promotion of local products. Projects like *Natur'Accessible* aim to develop accessible trails and raise awareness of Natura 2000 sites. Various eco-labels such as *Gîtes Panda, Ecogîtes, Green Globe, and Eco-Management and Audit Scheme (EMA)* are promoted to ensure environmental responsibility among tourism operators. Moreover, "green stops" initiatives such as those by *TrainTramBus* promote eco transportation options through accessible public transport stops for hiking. And *Accueil Champêtre* advocates for rural tourism, by endorsing locally sourced products and environmentally conscious farming methods (Fédération Inter-Environnement Wallonie, 2017).

The 2022 CGT report highlights significant achievements in Wallonia related to sustainability, in line with the 2030 Tourism Strategy. These include the operationalization of the *Wallonie Destination Qualité* initiative, with 11 workshops organized and 114 tourism enterprises participating to enhance service quality. The *ACCESS I* initiative, which improve accessibility for tourists with specific needs, has shown progress in enhancing accessibility by approving 5 new cycling routes bringing the total to 22 routes available for public use. Expanded resources such as a guide on accommodating individuals with disabilities and a dedicated website for promoting accessibility have also been developed to improve communication efforts in this area. The Wallonia Cycling Plan 2030 has seen the development of 2,089.5 km of long-distance cycling routes, 1,307.5 km of regional routes, and 782 km of international routes, promoting eco-friendly tourism. Additionally, Wallonia has directed €737 million toward sustainable reconstruction following the 2021 floods and has engaged in international networks like the International Social Tourism Organisation (ISTO) and the French Agence du Tourisme Durable (ATD) to align with global sustainable tourism practices. The establishment of two new national parks and initiatives in social tourism, including 54 group outings benefiting 1,854 people under *Article 27* (NGO working to make recreational tourism accessible to people in precarious situations by offering reduced-price tickets), further shows the region's commitment to inclusivity and environmental preservation which are key pillars of the 2030 strategy (CGT, 2023).

Despite the many accomplishments in this field, the Walloon Tourism Council has been recommending the creation of a Walloon Plan for Sustainable Tourism. Key features of this initiative include promoting tourism practices that take into account economic benefits while also considering social and environmental impacts in line with sustainable development principles. The Council highlights the importance of integrating Environmental, Social, and Governance (ESG) criteria, especially in response to the European Green Deal, to ensure the competitiveness of Wallonia's tourism sector. The Council also emphasizes the importance of advocating for tourism initiatives known as "Tourism for All " as it faces challenges because it is perceived as a budget friendly option (Conseil du Tourisme Wallon,2024).

5.5.5 STAKEHOLDER ENGAGEMENT IN SUSTAINABLE PRACTICES

In a survey conducted by the CGT in 2024 on stakeholder involvement in sustainable initiatives, it indicates that stakeholders within Wallonia's tourism industry have shown significant commitment to sustainable practices. This is especially prominent in aspects such as energy conservation efforts, consumption of local products, accessibility and community engagement.

The survey's results revealed that 68% of the participants have taken steps to lower their energy consumption by focusing on better management practices and upgrading heating systems as common strategies. However, 23% are still struggling due to limited resources availability. In addition, local sourcing is seen as a key priority within the industry; with 62% of tourism houses and 47% of other tourism businesses mentioning that they rely on local producers for more than half of their supplies. This practice not only boosts the local economy but also contributes to reducing environmental impact. Enhancing accessibility continues to be a priority. A large majority of attractions (81%) and tourism houses (71%) have improved their facilities to welcome individuals with specific needs, with 38% and 40% respectively aiming for Access I certification. Moreover, measures to reduce disruptions to residents have been put in place by 73% of hotels and 41% of attractions showing a dedicated effort towards engaging with the community. Additionally, 28% of attraction managers currently employ local residents in their operational management processes. All those efforts suggest that there is potential for enhancing the integration of communities (CGT, 2024).

The Tourism council highlights that the 2021 floods have accelerated the need for better management of tourist sites, particularly natural areas that saw an uncontrolled increased in visitors' number due to the pandemic. This has brought attention to the necessity of educating tourists on respecting natural sites. The Council advocates for a strategy that benefits both the economy and the environment, including continued support for studies like AGRETA, which analyse tourist flow management in relation to environmental sustainability, as well as the promotion of short supply chains, sustainable mobility options, and educational initiatives for tourism operators (Conseil du Tourisme Wallon, 2024).

6 DISCUSSION AND CONCLUSION

6.1 EXPLANATION OF THE FINDINGS

The flooding that occurred in Wallonia in 2021 had an impact on the region and posed additional challenges for the tourism sector which had already been facing difficulties as a result of the COVID-19 pandemic. The Destination Sustainability Framework (DSF) presented by Calgaro et al in 2013 offers a good approach for analysing this event by focusing on exposure levels, sensitivity and adaptability within the system. It offers an evaluation that takes into account the social consequences of the flood along with exploring how stakeholders have reacted to this incident and discussing the influence of recent regulations in encouraging environmentally friendly practices in the region.

The exposure is explained by the following characteristics:

- Population:

Belgium is one of the smallest countries in Europe with one of the highest population densities. The population in Wallonia is mainly concentrated in cities and towns, including areas near rivers like the Meuse and the Ourthe making it susceptible to flood risks due to their close proximity to water bodies. The major tourism hubs are also located in valleys and near river banks. These flood regions lead to disturbances, for both the local community and businesses.

- Biophysical environment:

The unique terrain of Wallonia with its rivers and diverse topography significantly influenced the impact of the flood in 2021. The wet conditions of that year saturated the soil and prevented proper absorption of rainwater leading to rapid spread of water that overflooded both natural and manmade drainage systems. This resulted in severe flooding especially in valleys where rainfall exceeded 200mm in just two days.

- Built environment:

The progress of build environment in Wallonia near rivers has notably raised the regions susceptibility to flooding incidents. A lot of these zones lack flood safeguards or flexible

infrastructure to coop with such event. In addition, the old structures in certain towns were not constructed to survive to extreme weather occurrences. The temporary shutdown of 47 tourist spots and other establishments shows the fragility of the constructed environment.

The below information will assess the sensitivity of the region to the flood:

- Tourism-specific sensitivities:

The flood happened at the worst possible time, right in the middle of the busy summer tourist season, amplifying the impact on the tourism industry in Wallonia. Before the flood hit unexpectedly and disrupted everything in 2021, the tourism industry was on the recovery from COVID-19 with more visitors and higher revenues coming in. However, the flood stopped the recovery and caused a drop of around 620,000 visitors in tourism attractions, from what was predicted for recovery after the pandemic. This setback didn't just hit revenue, it also slowed down heavily the recovery effort put into place to rebuild Wallonia's tourism industry. The tourists risk perception also had to be restored as even after reopening, most attractions still experienced a decrease of visitors.

- Economic sensitivity:

Wallonia heavily depends on seasonal visitors for its tourism sector and faced significant challenges in summer 2021. In 2019 the tourism industry played a big role in Wallonia's economy by generating around €6.25 billion in revenue and supporting about 7,5% of the regions workforce. However, the COVID-19 outbreak in 2020 caused a decreased of nearly 34% in revenue compared to the previous year. The significant drop in numbers highlighted the consequences of travel bans and lockdowns on tourism in the area. On top of that, the 2021 flood further amplified these financial difficulties. The flood struck at a critical time when the sector was beginning to show signs of recovery, with expectations of a gradual return to pre-pandemic levels. However, with the closure of important tourist attractions near rivers banks the sector lost another €708 million in turnover. Those substantial financial losses emphasise the sector's fragile recovery.

Despite efforts to stabilize and recover, the tourism sector's contribution to Wallonia's Gross Value Added (GVA) in 2021 remained below pre-pandemic levels. In 2021, the GVA contribution of the tourism sector was 3.66% down from 4.5% in 2019. This decline can be partly due to the compounded effects of the pandemic and the flood, which not only reduced visitor numbers but also delayed the reopening and full operational capacity of many tourism businesses. The tourism industry showed a slower recovery compared to other industries in the region, such as manufacturing and construction, which rebounded more quickly. All of this shows the sensitivity of the tourism industry and its reliance on other industries and external events. However, if we look at the entrepreneurial activity, we can see that despite the challenges, the net creation rate of tourism industries never stopped to increase throughout the years from 1,27% in 2019 to 2,14 in 2021 to 4,02% in 2022 which translates the industry capacity and determination to adapt and evolve within a fragile context.

- Physical and environmental sensitivity:

The flood caused damage to both the natural scenery and important man-made landmarks that attract tourists to Wallonia. The vulnerability of these locations to disasters shows the challenges in safeguarding tourism infrastructure from increasingly frequent extreme weather events. This destruction not just impacts the attractiveness of these destinations but also raises significant worries about their long-term durability.

Wallonia’s reaction to the flood of 2021 shows both positive actions and areas for improvement in handling crises while also pointing towards promising aspects for sustainable growth in the tourism sector in the long run. The following point will explain the system adaptiveness to this event:

- Immediate impact and coping responses:

The quick reaction to the flood, once the highest alert was given, shows a strong crisis management response from the regions with emergency services (volunteers and professionals) mobilized quickly to address the crisis. However, challenges due to communication and

coordination problems between federal and regional bodies arose, which impacted the effectiveness of crisis management efforts. The inconsistent handling of infrastructure, like dams added complexity to the situation. Despite these challenges at a global level, the whole community showed strength by adjusting to address the pressing issues. The tourism sector also showed great short-term adjustments with the development of the new VISITWallonia brand and the marketing campaign launched shortly after the flood. The CGT also tried to act quickly by focusing speeding up funding processes for flood impacted businesses.

- Long-term adjustments and adaptation:

After the flood the focus turned to rebuilding and fortifying the tourism industry for the future. The Walloon Recovery Plan 2021 was instrumental in this process, allocating €737 million to reconstruct infrastructure and encourage sustainable tourism approaches. Significant projects involved the growth of the RAVeL network and improvements in accessibility, through the ACCESS-I program. These initiatives played a role in incorporating sustainability into the recovery process to lower potential vulnerabilities and strengthen the industry's resilience. One crucial aspect of these changes involved the rebranding of Wallonie Belgique Tourisme (WBT) to VISITWallonia in 2022 and the enhanced promotion and interaction, via tailored marketing initiatives, centred on eco-friendly tourism approaches aimed at spreading out visitor numbers throughout the year, reducing seasonal fluctuations and promoting a more sustainable tourism framework.

- Governance and policy adaptation:

The recent flood in Wallonia put the regions crisis management system to the test and exposed a number of vulnerabilities in terms of coordination and communication between different levels of government. Federal and regional authorities specifically struggled to work together effectively during the crisis situation. The slow and sometimes conflicting reactions highlighted the need for better crisis management procedures in place. In light with this experience, Wallonia's Regional

Crisis Centre (CRC-W) along with key agencies started implementing more cohesive and flexible approaches to handling crises, placing a stronger emphasis on unified governance principles.

In the tourism industry, initiatives like the ones from VISITWallonia were instrumental in tackling governance issues by leveraging digital transformation efforts. One key component of this effort was the development of the Regional Commercialization Tool (ORC) which empowers tourism businesses to improve their online presence and customer interactions. The tool also helps in establishing public-private collaborations that enabled to combine resources and share knowledge efforts in marketing strategies. Wallonia's tourism system has also demonstrated adaptability through various digitalisation and sustainability initiatives established by the CGT. The PIVOT platform, which connects public authorities with tourism operators, illustrates how digital tools can enhance collaboration and improve decision-making processes across the sector. By facilitating data sharing and providing stakeholders with access to online tools for market analysis, the region can become more responsive to visitor needs and market trends. The CGT's free digital audits, workshops, and stakeholder development programs further helps involving local stakeholders in the digital transition. Moreover, Wallonia's governance framework has increasingly integrated sustainability principles, as evidenced by the Tourism Strategy for 2030 and initiatives such as the Wallonie Destination Qualité program, the RAVeL cycling routes plan, and eco-labeling schemes like Green Key and Bienvenue Vélo which promote environmentally responsible tourism practices and preserves the region's natural heritage. Lastly, Wallonia's emphasis on engaging stakeholders in sustainable practices, as highlighted by the CGT surveys, shows a growing commitment to energy conservation, local sourcing, and community engagement.

6.2 CONCLUSION

The analysis of the economic and social impacts of the flood of July 2021 on Wallonia's tourism sector deepens the understanding of the significant effects that natural hazards can have on tourism destinations if they are not prepared to receiving shocks with appropriate crisis management models. In Wallonia, we notice severe negative short-term impacts on the industry, causing job losses and economic difficulties, bringing the industry in a vulnerable situation.

However, the region's adaptiveness to the dramatic event was remarkable. Within a few months, the sector rebounded by establishing not only short-term responses to tackle the problem but major policy improvements and new governance arose with a focus on rebuilding the tourism sector as more resilient and sustainable. We could say that the flood acted as a driver in speeding up the regions move towards sustainability focus. Before the flood, sustainability initiatives were there but scattered and not given as much attention as other issues. The disaster revealed weaknesses in both infrastructure and governance which led towards stronger and more cohesive sustainable strategies. Wallonia's response included rebuilding with eco infrastructure projects, boosting resilience within the Walloon Recovery Plan. The rebranding of Wallonia Belgium Tourism to VISITWallonia in 2022 highlights the changing direction with an emphasis on sustainability throughout all seasons. The governance structure also evolved with strategies placing sustainability as a core principle as well as digitalisation and a stronger collaboration between the public and private sectors. These advancements demonstrate an extensive dedication to integrating sustainability into Wallonia's larger tourism plan to prepare the region for upcoming environmental challenges. Despite the various sustainable developments, Wallonia tourism sector still has room for improvement. Some recommendations would be to have a dedicated website for sustainable practices which would contain all the recent information on the topic, either for tourism professional or not. The website could for example offer training possibilities. Another improvement that needs to be taken into consideration is the importance of raising awareness among stakeholders but also among tourists about sustainability and the importance of adapting our behaviours in a world facing climate change. The word sustainability is still misunderstood or only partially understood by most people which can be an obstacle in the representation they have.

The research faces limitation challenges because it only depends on secondary data which may not completely grasp the complexity of how the flood affected the sector or the effectiveness of recovery plans. The fast pace at which post disaster recovery measures were being developed meant that certain projects are still new and it was challenging to evaluate their lasting effects.

Another issue was the difficulty in directly attributing the impact of tourism changes on the flood since the ongoing repercussions of COVID 19 also had a major influence.

This study could be improved by interviewing tourism stakeholders in Wallonia that have faced the flood to better understand their experience and how it affected them going forward. These discussions could delve into their thoughts on the recovery efforts and their involvement in sustainable practices within the sector. Furthermore, exploring their opinions on the changing policy environment would also be valuable. The semi-structure interview guide for these qualitative interviews is already prepared and can be found in annex 2. Moreover, a long-term study tracking how the flood continues to impact tourism trends and sustainability practices in Wallonia would offer insightful perspectives. Equally, comparing Wallonia approach to recovery and resilience to destinations impacted by similar crises could offer valuable insights for enhancing preparedness to disasters and promoting sustainable growth in the tourism industry. In 2024, Wallonia experienced other floodings in certain areas. Even though, their amplitude was smaller, it would be interesting to see how the new implemented strategies have helped in the face of a new event.

7 REFERENCES

Abric, J. (2005). *Méthodes d'étude des représentations sociales*. Érès. https://doi.org/10.3917/eres.abric.2003.01

Atout France – Altea. (2009). *Demande des clientèles en tourisme durable: enquête qualitative, 2009*.

Becken, S., Mahon, R., Rennie, H., & Shakeela, A. (2014). The tourism disaster vulnerability framework: An application to tourism in small island destinations. *Natural Hazards, 71*(1), 955-972. https://doi.org/10.1007/s11069-013-0946-x

Beckers, B. (2022). *Pourquoi les inondations de 2021 n'ont pas été anticipées* [Video]. LN24. https://www.youtube.com/watch?v=c0JB9g1i-7M

Binamé, A., & Laboratoire de Climatologie de l'Université de Liège. (2021). Intempéries et inondations : quel bilan météorologique en tirer ? *RTBF*. https://www.rtbf.be/article/intemperies-et-inondations-quel-bilan-meteorologique-en-tirer-10807460

Boverie, M., Robert, J., Ceder, T., Delaite, G., Ransy, A., & De Schutter, T. (2022). *Focus sur les inondations de juillet 2021*. Union des Villes et Communes de Wallonie / Fédération des CPAS. https://www.uvcw.be/voirie/articles/art-7881

Buszta, J., Wójcik, K., Santos, C. A. G., Kozioł, K., & Maciuk, K. (2023). Historical analysis and prediction of the magnitude and scale of natural disasters globally. *Resources, 12*(9), 106. https://doi.org/10.3390/resources12090106

Butler, R. (1999). Sustainable tourism: A state-of-the-art review. *Tourism Geographies, 1*(1), 7-25. https://doi.org/10.1080/14616689908721291

Calgaro, E., Lloyd, K., & Dominey-Howes, D. (2013). From vulnerability to transformation: A framework for assessing the vulnerability and resilience of tourism destinations. *Journal of Sustainable Tourism, 22*(3), 341–360. https://doi.org/10.1080/09669582.2013.826229

Carbon footprint of tourism. (2020). *Sustainable Travel International*. https://sustainabletravel.org/issues/carbon-footprint-tourism/

Centre for Research on the Epidemiology of Disasters [CRED]. *The international disasters database [EM-DAT]* (n.d.). https://www.emdat.be/

CGT & Wallonie Belgique Tourisme. (2021). *Etude stratégique sur le tourisme en Wallonie: Stratégie Tourisme 2030 – Restitution des résultats de l'étude en commission parlementaire*.

Chaudhary, M. T., & Piracha, A. (2021). Natural disasters—Origins, impacts, management. *Encyclopedia, 1*(4), 1101–1131. https://doi.org/10.3390/encyclopedia1040084

Colamonici, L. (2021). Le difficile rebond du tourisme wallon après les inondations. *L'Echo*. https://www.lecho.be/entreprises/tourisme/le-difficile-rebond-du-tourisme-wallon-apres-les-inondations/10323233.html

Commissariat Général au Tourisme [CGT] & IWEPS. (2023). *Poids économique et social du tourisme en Wallonie 2021-2022*.

Commissariat Général au Tourisme [CGT]. (2020). *La Wallonie touristique en chiffres - données 2019*.

Commissariat Général au Tourisme [CGT]. (2021). *La Wallonie touristique en chiffres - données 2020*.

Commissariat Général au Tourisme [CGT]. (2022). *La Wallonie touristique en chiffres - données 2021*.

Commissariat Général au Tourisme [CGT]. (2022). *Rapport d'activité 2021*.

Commissariat Général au Tourisme [CGT]. (2023). *La Wallonie touristique en chiffres - données 2022*.

Commissariat Général au Tourisme [CGT]. (2023). *Rapport d'activité 2022*.

Commissariat Général au Tourisme [CGT]. (2024). *Les actions de durabilité chez les opérateurs touristiques wallons*. https://owt.tourismewallonie.be/telechargement/la-durabilite-les-

operateurs-touristiques-wallons/?ind=1713965803294&filename=Les%20actions%20de%20durabilit%C3%A9%20des%20op%C3%A9rateurs%20touristiques.pdf&wpdmdl=5239&refresh=66c59f9cc584b1724227484

Commissariat Général au Tourisme [CGT]. (n.d.). *Bienvenue sur le site officiel du tourisme en Wallonie*. Tourisme Wallonie. https://www.tourismewallonie.be/

Conférence Permanente du Développement Territorial [CPDT], Université Libre de Bruxelles - IGEAT, & Université de Liège - Lepur. (2021). *Recherche 4: Tourisme et territoire: Gérer le passé pour préparer l'avenir - Rapport scientifique*.

Conseil du Tourisme Wallon. (2024). *MEMORANDUM 2024-2029*. https://www.cesewallonie.be/sites/default/files/uploads/Conseils%20consultatifs/Tourisme/2024_TOUR_M%C3%A9mo.pdf

Council of the European Union. (2022). *European Agenda for Tourism 2030*. Council Conclusion 15441/22.

Cronstedt, M. (2002). Prevention, preparedness, response, recovery—An outdated concept? *The Australian Journal of Emergency Management, 17*, 10.

De Beer De Laer, H., & De Myttenaere, B. (2023). Enjeux du « tourisme durable » en Wallonie. *Futurama N°13 - Transition Et Loisirs: Quels Futurs Pour Le Tourisme En Wallonie?*. https://www.iweps.be/wp-content/uploads/2023/12/2_H-DE-BEER-FTM-Tourisme-301123.pdf

Desprez, M. (2022). Au sommet Climate Chance Europe, l'enjeu de la déclinaison locale des politiques environnementales. *Les Horizons*. https://leshorizons.net/retour-sommet-climate-chance-europe-2022/?utm_

EUROPARC. (2023). *Sustainable tourism*. EUROPARC Federation. https://www.europarc.org/sustainable-tourism/

European Commission. (2007). *Agenda for a sustainable and competitive European tourism*. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0621:FIN:EN:PDF

European Commission. (2016). *Eurobarometer: Preferences of Europeans towards tourism*. https://europa.eu/eurobarometer/surveys/detail/2065

European Commission. (2021). *Eurobarometer: Attitudes of Europeans towards tourism*. https://europa.eu/eurobarometer/surveys/detail/2283

European Commission. (2021). *The green transition of tourism*. https://single-market-economy.ec.europa.eu/sectors/tourism/eu-tourism-transition/green-transition-tourism_en

European Commission: Joint Research Centre, Anca Matei, N., García-León, D., Dosio, A., Batista e Silva, F., Barranco, R., & Císcar Martínez, J. (2023). *Regional impact of climate change on European tourism demand*. Publications Office of the European Union. https://data.europa.eu/doi/10.2760/899611

European Parliament. (2021). *EU strategy for sustainable tourism*. https://doi.org/10.1016/j.tourman.2020.104080

Faulkner, B. (2001). Towards a framework for tourism disaster management. *Tourism Management, 22*(2), 135-147. https://doi.org/10.1016/S0261-5177(00)00048-0

Fédération du Tourisme de la Province de Liège. (2022). *Stratégie écotouristique 2024-2028*. https://www.tourismepro.be/medias/documents/documentation/documentation-STRATECOTOUR-FR.pdf

Fédération Inter-Environnement Wallonie. (2017). *Tourisme durable - une opportunité pour la Wallonie*.

Gleick, J. (1987). *Chaos: Making a new science*. Heinemann.

Gouvernement Wallon. (2019). *Plan wallon de sortie de la pauvreté*. https://luttepauvrete.wallonie.be/sites/default/files/field/plan_wallon_de_sortie_de_la_pauvrete.pdf

IRM. (n.d.). 2021: Une année humide et des précipitations extrêmes. *IRM*. https://www.meteo.be/fr/infos/actualite/2021-une-annee-humide-et-des-precipitations-extremes

Kaklauskas, A., Amaratunga, R., & Haigh, R. (2009). Knowledge model for post-disaster management. *International Journal of Strategic Property Management, 13*(2), 117-128. https://doi.org/10.3846/1648-715x.2009.13.117-128

KPMG & VISITWallonia. (2021). *Stratégie digitale 2025 pour le tourisme en Wallonie*.

Lenzen, M., Sun, Y., Faturay, F., Ting, Y., Geschke, A., & Malik, A. (2018). The carbon footprint of global tourism. *Nature Climate Change, 8*(6), 522–528. https://doi.org/10.1038/s41558-018-0141-x

Mansfeld, Y. (1999). Cycles of war, terror, and peace: Determinants and management of crisis and recovery of the Israeli tourism industry. *Journal of Travel Research, 38*(1), 30-36. https://doi.org/10.1177/004728759903800107

Michel, R., & Van Dijck, F. (2010). Les risques naturels en région wallonne. *BSGLg, 54*, 157-176.

Mizutori, M. (2020). Time to say goodbye to “natural” disasters. *PreventionWeb*. https://www.preventionweb.net/drr-community-voices/time-say-goodbye-natural-disasters

ORAPI Asia. (2024). A comprehensive evaluation of GHG emissions. https://orapiasia.com/a-comprehensive-evaluation-of-ghg-emissions/#:~:text=GtCO2e%20is%20used%20to%20express,28%20tons%20of%20carbon%20dioxide

Oxford University Press. (n.d.). *Exposure*. In *Oxford English Dictionary*. https://www.oed.com/dictionary/exposure_n?tab=factsheet#4820771

Parent, J.-C. (2023). *FUTURAMA “Attraction et Tourisme Asbl”* [Slide show]. FUTURAMA « Transition Et Loisirs: Quels Futurs Pour Le Tourisme En Wallonie? » 30 Novembre 2023,

Belgium. https://www.iweps.be/wp-content/uploads/2023/12/4_JC-PARENT-FTM-Tourisme-301123.pdf

Prideaux, B., Laws, E., & Faulkner, B. (2003). Events in Indonesia: Exploring the limits to formal tourism trends forecasting methods in complex crisis situations. *Tourism Management, 24*(4), 475-487. https://doi.org/10.1016/s0261-5177(02)00115-2

Ritchie, H., & Roser, M. (2024). The world has become more resilient to disasters, but investment is needed to save more lives. *Our World in Data*. https://ourworldindata.org/the-world-has-become-more-resilient-to-disasters-but-investment-is-needed-to-save-more-lives#article-citation

Rosselló, J., Becken, S., & Santana-Gallego, M. (2020). The effects of natural disasters on international tourism: A global analysis. *Tourism Management, 79*, 104080. https://doi.org/10.1016/j.tourman.2020.104080

Sahni, P. (2003). Drought profile, management and risk reduction in India. In *Disaster risk reduction in South Asia* (pp. 299-326). Prentice-Hall of India Private Limited.

Scott, D., Amelung, B., Becken, S., Ceron, J. P., Dubois, G., Gössling, S., ... & Simpson, M. (2008). *Climate change and tourism: Responding to global challenges*. World Tourism Organization, Madrid.

Stabel. (2024). 4% de nuitées touristiques en plus en 2023. https://statbel.fgov.be/fr/nouvelles/4-de-nuitees-touristiques-en-plus-en-2023

Tomori, F. (2023). *Economic analysis of tourist markets - Chapter 4: Tourism demand* [Slide show].

Tradowsky, J. S., Philip, S. Y., Kreienkamp, F., et al. (2023). Attribution of the heavy rainfall events leading to severe flooding in Western Europe during July 2021. *Climatic Change, 176*(90), 1-20. https://doi.org/10.1007/s10584-023-03502-7

Tucker, H., Shelton, E. J., & Bae, H. (2016). Post-disaster tourism: Towards a tourism of transition. *Tourist Studies, 17*(3), 306-327. https://doi.org/10.1177/1468797616671617

Turner, B. L., Kasperson, R. E., Matson, P. A., McCarthy, J. J., Corell, R. W., Christensen, L., Eckley, N., Kasperson, J. X., Luers, A., Martello, M. L., Polsky, C., Pulsipher, A., & Schiller, A. (2003). A framework for vulnerability analysis in sustainability science. *Proceedings of the National Academy of Sciences of the United States of America, 100*(14), 8074–8079. https://doi.org/10.1073/pnas.1231335100

United Nations. (2015). *Paris Agreement*. https://unfccc.int/files/essential_background/convention/application/pdf/english_paris_agreement.pdf

VISITWallonia. (2022). *Rapport d'activités 2021*.

VISITWallonia. (2023). *Rapport d'activités 2022*.

VISITWallonia. (n.d.). *Votre site officiel du tourisme en Wallonie*

Walker, B., Holling, C. S., Carpenter, S. R., & Kinzig, A. P. (2004). Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society, 9*(2). https://doi.org/10.5751/es-00650-090205

Wallonie économie SPW, IWEPS, & SOGEPA. (2022). *Rapport sur l'économie wallonne*.

Wang, J., & Ritchie, B. W. (2012). Understanding accommodation managers' crisis planning intention: An application of the theory of planned behaviour. *Tourism Management, 33*(5), 1057–1067. https://doi.org/10.1016/j.tourman.2011.12.006

World Disasters Report 2020 Come heat or high water. (2020). *International Federation of Red Cross and Red Crescent Societies*. https://www.ifrc.org/world-disasters-report-2020

World Health Organization: WHO. (2019). *Floods*. https://www.who.int/health-topics/floods#tab=tab_1

World Tourism Organization [UNWTO]. (2021). *International tourism highlights, 2020 edition*. UNWTO. https://doi.org/10.18111/9789284422456

World Tourism Organization [UNWTO]. (2021). *One Planet Sustainable Tourism Programme - The Glasgow Declaration: A Commitment to a Decade of Tourism Climate Action*. https://www.oneplanetnetwork.org/sites/default/files/2022-02/GlasgowDeclaration_EN_0.pdf

World Tourism Organization [UNWTO]. (2023). *Goa roadmap for tourism as a vehicle for achieving the Sustainable Development Goals*. UNWTO. https://doi.org/10.18111/9789284424443

World Tourism Organization [UNWTO]. (n.d.). *Sustainable development*. https://www.unwto.org/sustainable-development

8 ANNEXES

8.1 ANNEX 1: EU ROADMAP - THE FIVE SUSTAINABLE TOURISM STANDARDS

Table 2: The five Sustainable Tourism Standards (World Tourism Organization, 2023)

Area	Focus
Green Tourism	▪ Developing energy-efficient infrastructure ▪ Effective resource management ▪ Circular economy practices ▪ Pollution reduction ▪ Empowering and including local communities ▪ Investing in regenerative tourism efforts ▪ Sustainable and inclusive economic growth through investments, data utilization, and innovation ▪ Promoting responsible visitor behaviour (saving energy, conserving water, minimizing waste, safeguarding biodiversity)
Digitalisation	▪ Improving visitor experience through digital technologies ▪ Coordinating digitalization with other sectors ▪ Using digital tools for data collection, analysis, and reporting ▪ Establishing policies for visitor protection and fair competition with an emphasis on local businesses
Skills	▪ Improving workforce abilities and knowledge ▪ Addressing the sector's negative image ▪ Identifying skill gaps ▪ Providing training and educational opportunities ▪ Special strategies for vulnerable groups ▪ Emphasizing lifelong learning and digital skills training for small businesses and local communities ▪ Developing training programs focused on sustainability
MSMEs	▪ Supporting MSMEs' digital and environmental resilience ▪ Inclusive financing and diverse learning opportunities ▪ Encouraging visitors to choose local products, indigenous experiences, and women-led enterprises
Destination Management	▪ Positioning DMOs as central players in the tourism ecosystem ▪ Encouraging learning across DMOs and stakeholders ▪ Promoting new governance models through public-private-community partnerships and frameworks involving local communities and visitors

8.2 ANNEX 2: SEMI-STRUCTURED INTERVIEW GUIDELINES FOR TOURISM STAKEHOLDERS

Table 3: Semi-structured interview guidelines for tourism stakeholders

SECTION 1: INTRODUCTION AND CONSENT	
Introduction on the purpose of the study.	
Before we begin, I want to ensure you are comfortable. Do you have any questions about the study or concerns?	
Can you start by telling us a bit about yourself and your connection to the city/town/community?	
SECTION 2: GENERAL INFORMATION ON THE BUSINESS/ORGANISATION	
Can you provide a brief overview of your business/organization (e.g., type, size, location)?	
What is the primary focus or main services provided by your business/organization?	
Who are your primary customers or target market?	
Did you notice a change/shift in your target market? If yes, how has your target market evolved over the years?	**Yes** **No**
What are the key operational challenges you face in the tourism industry?	
Do you experience a high seasonality? If yes, how do you typically handle peak and off-peak seasons?	**Yes** **No**
How many employees do you have, and do they have a big responsibility in decision making?	**Yes** **No**
Have you faced any workforce challenges recently, such as staff shortages or turnover?	
SECTION 3: PERSONAL INSIGHTS AND EXPERIENCES	

Did you personally experience the flood of July 2021? If yes, can you briefly describe that event/day?	
Did you get directly impacted by the flood on a personal level?	**Yes** **No**
What kind of support system were directly put in place after the flood? (e.g., family/ friends/community)	
Can you share a story or memorable moment from the flood?	
When you think about that day, what kind of emotion do feel?	
How has the flood impacted you emotionally and psychologically?	
SECTION 4: GENERAL IMPACT OF THE FLOOD	
Did your business get directly impacted by the flood? If yes, can you describe the immediate impact?	**Yes** **No**
Did you have to close down your establishment because of the flood? If yes, for how long?	**Yes** **No**
What were the financial losses incurred due to the flood (e.g., revenue, infrastructure damage)?	
How did the flood affect visitor numbers in the aftermath and after reopening?	
Have you noticed changes in visitor behaviour or attitudes since the flood?	
How has the flood affected the local community and your staff emotionally and psychologically?	
SECTION 5: RESILIENCE AND RECOVERY STRATEGIES	
What strategies did you implement to cope with the immediate aftermath of the flood?	
Can you share any innovative approaches you adopted to rebuild and recover?	

Did you receive any support from the government, NGOs, or other organizations?	
What type of assistance (financial, advisory, etc.) was most helpful during the recovery phase?	
If we think about long term strategies, how are you planning to enhance the resilience of your business/organization to future natural disasters?	
What lessons have you learned from the flood that could help you better prepare for similar events in the future?	
SECTION 6: CLIMATE CHANGE PERCEPTIONS	
Do you think the flood has changed your perception of natural disasters? If so, what was your perception before and what is your perception now?	**Yes** **No**
According to various studies, climate change has intensified the risks linked to natural disaster. Would you agree with that?	**Yes** **No**
Do you feel concern about climate change?	**Yes** **No**
Do you think the flood has raised your awareness about climate change?	**Yes** **No**
Have you made any changes to your business practices in response to climate change concerns? If so, what changes?	
According to you, what is needed to become more resilient to climate change and its associated events?	
Do you think the tourism industry has a role to play in tackling the issue of climate change?	**High / Medium / Low / No**
SECTION 7: SUSTAINABLE PRACTICES	
How has the flood influenced your perception of sustainability and the need for sustainable practices?	
Can you give me the first idea that comes to your mind when talking about sustainability?	

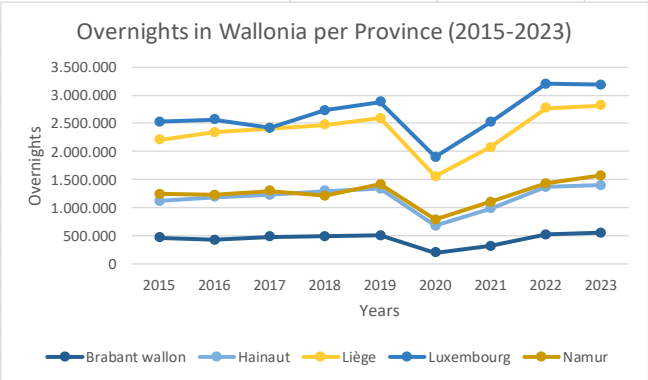
Have you implemented any new sustainability initiatives since the flood?	
What priority does sustainability have in your business? Why are the reasons?	**High priority / Medium priority / Low priority / Not existent**
Have you faced challenges have in engaging with sustainability initiatives? If yes, what were they?	
Do you think businesses need external support/resources in order to implement more sustainable initiatives?	
Do you receive any support from the government to implement sustainability strategies (financial, technical assistance, training, etc.)? Is it enough? Were they any additional resources allocated to impacted businesses after the flood?	
In your opinion, what is the most important tool in moving forward with the sustainable transition? (communication, stakeholders' collaboration, pro-active governance, etc…)	
SECTION 8: FUTURE OUTLOOK AND RECOMMENDATIONS	
What are your priorities moving forward to ensure the sustainability and resilience of your business/organization?	
How do you see sustainable tourism evolving in Wallonia in the next few years?	
What recommendations would you give to policymakers to better support the tourism sector in disaster-prone areas?	
SECTION 9: SOCIO-DEMOGRAPHIC INFORMATION	
Age	
Gender	
Role in the business	

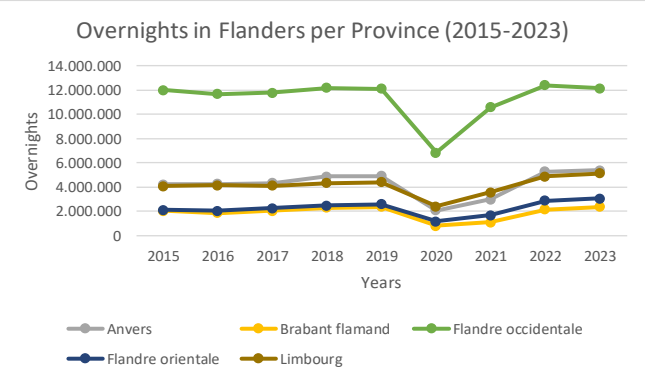
8.3 ANNEX 3: CALCULATION OVERNIGHTS STAYS IN BELGIUM PER PROVINCE

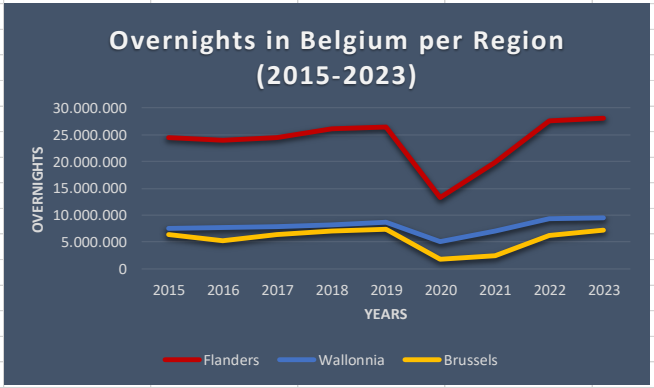
Overnights per region (2015-2023)									
	2015	2016	2017	2018	2019	2020	2021	2022	2023
Belgium	38.380.415	36.855.214	38.677.308	41.320.284	42.512.847	20.177.486	29.220.847	43.024.124	44.696.602
Flanders	24.379.810	23.894.894	24.511.335	26.126.619	26.356.863	13.276.415	19.859.409	27.522.155	28.042.853
Wallonnia	7.557.392	7.749.825	7.830.796	8.200.604	8.727.266	5.118.198	6.990.502	9.281.177	9.526.626
Brussels	6.443.213	5.210.495	6.335.177	6.993.061	7.428.718	1.782.873	2.370.936	6.220.792	7.127.123

Overnights per province (2015-2023)									
	2015	2016	2017	2018	2019	2020	2021	2022	2023
Anvers	4.204.366	4.241.787	4.333.706	4.864.460	4.912.144	2.056.957	2.984.935	5.273.380	5.360.150
Brabant flamand	2.017.825	1.843.751	2.030.847	2.295.796	2.348.709	805.360	1.076.461	2.127.693	2.347.029
Brabant wallon	463.620	429.537	479.080	488.009	507.424	196.377	317.903	517.975	552.952
Flandre occidentale	11.981.763	11.651.144	11.776.860	12.182.123	12.117.431	6.843.417	10.573.285	12.391.043	12.149.691
Flandre orientale	2.110.766	2.015.947	2.264.035	2.454.113	2.565.512	1.164.263	1.673.154	2.869.279	3.050.344
Hainaut	1.119.235	1.183.443	1.225.305	1.296.905	1.337.620	677.447	985.025	1.367.967	1.399.808
Liège	2.206.057	2.341.931	2.412.971	2.468.194	2.590.225	1.553.652	2.069.236	2.766.896	2.820.576
Limbourg	4.065.090	4.142.265	4.105.887	4.330.127	4.413.067	2.406.418	3.551.574	4.860.760	5.135.639
Luxembourg	2.528.170	2.565.695	2.417.871	2.733.464	2.881.127	1.902.634	2.516.831	3.200.491	3.184.468
Namur	1.240.310	1.229.219	1.295.569	1.214.032	1.410.870	788.088	1.101.507	1.427.848	1.568.822

Source: Statbel







8.4 ANNEX 4: CALCULATION OVERNIGHTS STAYS PER PROVINCE PER MONTH

Overnights per province (2015-2023)

Territory	2015	2016	2017	2018	2019	2020	2021	2022	2023
Brabant wallon	463.620	429.537	479.080	488.009	507.424	196.377	317.903	517.975	552.952
Hainaut	1.119.235	1.183.443	1.225.305	1.296.905	1.337.620	677.447	985.025	1.367.967	1.399.808
Liège	2.206.057	2.341.931	2.412.971	2.468.194	2.590.225	1.553.652	2.069.236	2.766.896	2.820.576
Luxembourg	2.528.170	2.565.695	2.417.871	2.733.464	2.881.127	1.902.634	2.516.831	3.200.491	3.184.468
Namur	1.240.310	1.229.219	1.295.569	1.214.032	1.410.870	788.088	1.101.507	1.427.848	1.568.822
Wallonia	7.557.392	7.749.825	7.830.796	8.200.604	8.727.266	5.118.198	6.990.502	9.281.177	9.526.626

Source: Statbel

Overnights per province per month 2019

Territory	January	February	March	April	May	June	July	August	September	October	November	December
Brabant wallon	33.357	31.962	38.432	47.648	46.411	43.966	47.194	47.606	44.138	47.149	39.321	40.240
Hainaut	71.688	81.580	97.366	126.866	116.320	125.289	160.273	146.146	110.404	120.490	94.192	87.006
Liège	98.246	116.008	145.757	241.943	223.065	241.736	375.097	376.908	222.007	230.094	161.509	157.855
Luxembourg	86.382	115.576	145.595	250.523	225.364	266.061	505.751	502.157	212.238	231.358	167.402	172.720
Namur	44.695	54.248	83.972	133.667	112.415	125.346	226.245	218.604	113.751	127.461	87.112	83.354
Wallonia 2019	334.368	399.374	511.122	800.647	723.575	802.398	1.314.560	1.291.421	702.538	756.552	549.536	541.175

Source: OWT - Fréquentation mensuelle des hébergements 2019

Overnights per province per month 2020

Territory	January	February	March	April	May	June	July	August	September	October	November	December
Brabant wallon	34.852	33.838	11.047	565	1.254	8.387	25.187	26.430	19.967	16.857	8.947	9.046
Hainaut	71.434	87.745	39.652	3.367	6.128	49.106	127.128	105.163	69.594	60.532	29.976	27.622
Liège	106.009	137.236	62.217	9.620	11.430	90.319	364.888	354.744	194.144	115.283	48.724	59.038
Luxembourg	87.727	116.066	47.893	328	2.157	114.749	575.496	543.596	229.382	105.970	38.963	40.307
Namur	37.683	57.068	24.703	353	1.109	48.605	230.427	197.902	94.152	51.224	23.874	20.988
Wallonia 2020	337.705	431.953	185.512	14.233	22.078	311.166	1.323.126	1.227.835	607.239	349.866	150.484	157.001

Source: OWT - Fréquentation mensuelle des hébergements 2020

Overnights per province per month 2021

Territory	January	February	March	April	May	June	July	August	September	October	November	December
Brabant wallon	10.582	13.928	14.576	16.780	19.942	24.325	35.855	39.125	39.129	44.147	33.706	25.808
Hainaut	25.334	35.846	51.855	68.050	69.071	78.649	151.636	132.519	103.047	112.889	84.473	71.656
Liège	56.603	79.885	65.314	140.970	143.051	159.588	377.021	361.177	196.663	205.845	151.485	131.634
Luxembourg	30.758	68.288	68.966	163.905	156.717	201.192	513.693	550.379	224.072	219.998	170.520	148.343
Namur	16.277	34.275	26.794	82.292	78.314	85.829	226.762	189.709	104.680	113.791	81.772	61.012
Wallonia 2021	139.554	232.222	227.505	471.997	467.095	549.583	1.304.967	1.272.909	667.591	696.670	521.956	438.453

Source: OWT - Fréquentation mensuelle des hébergements 2021

Overnights per province per month 2022

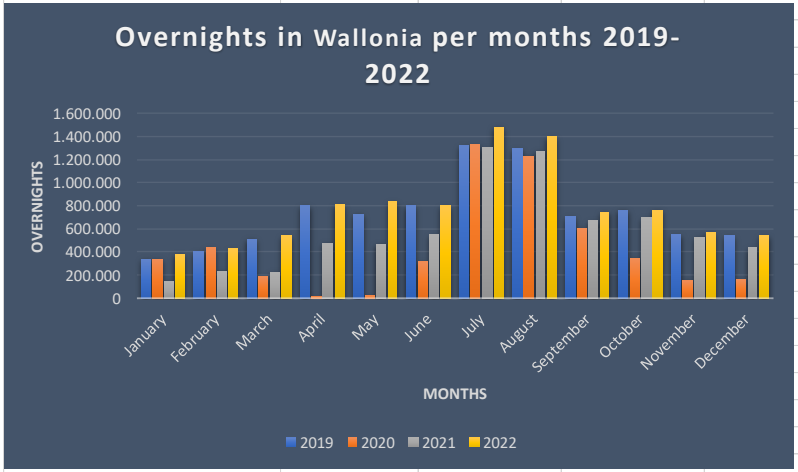
Territory	January	February	March	April	May	June	July	August	September	October	November	December
Brabant wallon	22.381	27.469	34.281	41.901	50.756	48.773	55.206	52.173	47.460	52.581	43.565	41.429
Hainaut	64.631	76.139	94.746	126.857	123.179	126.019	174.280	161.909	117.042	122.807	91.568	88.790
Liège	118.169	130.062	158.551	235.087	259.726	244.709	430.012	404.090	226.885	227.122	167.762	164.721
Luxembourg	127.877	138.418	169.897	273.330	275.873	265.383	573.405	561.714	234.757	238.388	172.108	169.341
Namur	48.133	56.706	85.261	129.461	125.788	118.306	244.706	218.631	118.453	119.832	87.668	74.903
Wallonia 2022	381.191	428.794	542.736	806.636	835.322	803.190	1.477.609	1.398.517	744.597	760.730	562.671	539.184

Source: OWT - Fréquentation mensuelle des hébergements 2022

Overnights in Wallonie per mois (2019-2022)

Wallonia	January	February	March	April	May	June	July	August	September	October	November	December
2019	334.368	399.374	511.122	800.647	723.575	802.398	1.314.560	1.291.421	702.538	756.552	549.536	541.175
2020	337.705	431.953	185.512	14.233	22.078	311.166	1.323.126	1.227.835	607.239	349.866	150.484	157.001
2021	139.554	232.222	227.505	471.997	467.095	549.583	1.304.967	1.272.909	667.591	696.670	521.956	438.453
2022	381.191	428.794	542.736	806.636	835.322	803.190	1.477.609	1.398.517	744.597	760.730	562.671	539.184

Source: OWT - Fréquentation mensuelle des hébergements 2019-2022



8.5 ANNEX 5: CALCULATION GROWTH RATE OVERNIGHTS STAYS

Overnights Belgium 2015-2023

	Belgium	Flanders	Wallonia	Brussels
2015	38.380.415	24.379.810	7.557.392	6.443.213
2016	36.855.214	23.894.894	7.749.825	5.210.495
2017	38.677.308	24.511.335	7.830.796	6.335.177
2018	41.320.284	26.126.619	8.200.604	6.993.061
2019	42.512.847	26.356.863	8.727.266	7.428.718
2020	20.177.486	13.276.415	5.118.198	1.782.873
2021	29.220.847	19.859.409	6.990.502	2.370.936
2022	43.024.124	27.522.155	9.281.177	6.220.792
2023	44.696.602	28.042.853	9.526.626	7.127.123

Growth rate

	Belgium	Flanders	Wallonia	Brussels
	-3,97%	-1,99%	2,55%	-19,13%
	4,94%	2,58%	1,04%	21,58%
	6,83%	6,59%	4,72%	10,38%
	2,89%	0,88%	6,42%	6,23%
	-52,54%	-49,63%	-41,35%	-76,00%
	44,82%	49,58%	36,58%	32,98%
	47,24%	38,58%	32,77%	162,38%
	3,89%	1,89%	2,64%	14,57%

Growth rate in Wallonia per month

Wallonia	2019	2020	2021	2022	2019-2020	2020-2021	2021-2022
January	334.368	337.705	139.554	381.191	0,01	-0,59	1,73
February	399.374	431.953	232.222	428.794	0,08	-0,46	0,85
March	511.122	185.512	227.505	542.736	-0,64	0,23	1,39
April	800.647	14.233	471.997	806.636	-0,98	32,16	0,71
May	723.575	22.078	467.095	835.322	-0,97	20,16	0,79
June	802.398	311.166	549.583	803.190	-0,61	0,77	0,46
July	1.314.560	1.323.126	1.304.967	1.477.609	0,01	-0,01	0,13
August	1.291.421	1.227.835	1.272.909	1.398.517	-0,05	0,04	0,10
September	702.538	607.239	667.591	744.597	-0,14	0,10	0,12
October	756.552	349.866	696.670	760.730	-0,54	0,99	0,09
November	549.536	150.484	521.956	562.671	-0,73	2,47	0,08
December	541.175	157.001	438.453	539.184	-0,71	1,79	0,23
Total	8.727.266	5.118.198	6.990.502	9.281.177	-0,41	0,37	0,33

8.6 ANNEX 6: CALCULATION SEASONALITY

Wallonia	2019	2020	2021	2022
January	334.368	337.705	139.554	381.191
February	399.374	431.953	232.222	428.794
March	511.122	185.512	227.505	542.736
April	800.647	14.233	471.997	806.636
May	723.575	22.078	467.095	835.322
June	802.398	311.166	549.583	803.190
July	1.314.560	1.323.126	1.304.967	1.477.609
August	1.291.421	1.227.835	1.272.909	1.398.517
September	702.538	607.239	667.591	744.597
October	756.552	349.866	696.670	760.730
November	549.536	150.484	521.956	562.671
December	541.175	157.001	438.453	539.184
Total	8.727.266	5.118.198	6.990.502	9.281.177

2019		VC	Theil
Average	727.272	0,424920735	
January	334.368		0,06475
February	399.374		0,04995
March	511.122		0,02939
April	800.647		-0,00801
May	723.575		0,00042
June	802.398		-0,00819
July	1.314.560		-0,04933
August	1.291.421		-0,04785
September	702.538		0,00288
October	756.552		-0,00329
November	549.536		0,02335
December	541.175		0,02463

2020		VC	Theil
Average	426.517	1,011221685	
January	337.705		0,01946
February	431.953		-0,00106
March	185.512		0,06938
April	14.233		0,28334
May	22.078		0,24676
June	311.166		0,02628
July	1.323.126		-0,09434
August	1.227.835		-0,08811
September	607.239		-0,02944
October	349.866		0,01651
November	150.484		0,08682
December	157.001		0,08328

2021		VC	Theil
Average	582.542	0,637030801	
January	139.554		0,11908
February	232.222		0,07664
March	227.505		0,07835
April	471.997		0,01754
May	467.095		0,01841
June	549.583		0,00485
July	1.304.967		-0,06721
August	1.272.909		-0,06514
September	667.591		-0,01136
October	696.670		-0,01491
November	521.956		0,00915
December	438.453		0,02368

2022		VC	Theil
Average	773.431	0,447641139	
January	381.191		0,05896
February	428.794		0,04916
March	542.736		0,02952
April	806.636		-0,00350
May	835.322		-0,00642
June	803.190		-0,00315
July	1.477.609		-0,05395
August	1.398.517		-0,04936
September	744.597		0,00317
October	760.730		0,00138
November	562.671		0,02651
December	539.184		0,03007