

The Impact of Covid-19 on Sustainable Tourism in UNESCO EuroMAB Mountain Biosphere Reserves

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Science at the University of the Highlands & Islands

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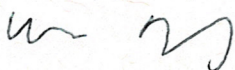


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Abstract

The outbreak of Covid-19 in 2019 has severely impacted global tourism, with unprecedented declines in the industry. This impact has been especially felt in mountain regions, which have become increasingly dependent on tourism as an economic motor over the past 50 years. As the industry enters the recovery stage of the pandemic, tourism stakeholders call for a move to a more sustainable model – sustainable tourism. However, indications suggest that this move is not happening, in part due to a lack of research analysing the resilience of sustainable tourism in the face of Covid-19. This study helps contribute to filling this research gap. Through the creation of a literature review summarising current empirical case-studies on Covid-19 and sustainable tourism across the world, a survey was created that combined qualitative and quantitative questions. The survey was sent to participants of 39 Mountain Biosphere Reserves (MBRs) within the EuroMAB network, asking about the impact of Covid-19 on Sustainable Tourism within the MBRs, perceptions of resilience and its relationship to sustainable development, and the role of the network in supporting innovation and resilience during the pandemic. Findings in this research reveal MBR sustainable tourism has demonstrated resilience, with MBRs transforming, innovating, and optimising on the surge in demand for nature-based tourism during a period of unprecedented disruption in the global tourism industry. The study highlights the importance of four factors for sustainable tourism resilience – diversity, support networks, innovation and the following of sustainable development principles. In particular, diversity is key, with those with a diversity in tourists and businesses having done better than those which are reliant on a certain type. Overall, this study provides an empirical study which demonstrates how a resilient, sustainable tourism can help mountain communities thrive and resist external global threats such as Covid-19 and climate change.

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Abbreviations and acronyms

BR*	Biosphere Reserve
EuroMAB	European MAB network
MAB	Man and Biosphere (programme)
MBR*	Mountain Biosphere Reserve
NGO	Non-Governmental Organisation
SD	Sustainable Development
SDG	Sustainable Development Goal
SES	Social-Ecological Systems
ST	Sustainable Tourism
SMD	Sustainable Mountain Development
UHI	University of the Highlands and Islands
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WHO	World Health Organisation
WNBR	World Network of Biosphere Reserves

* Please note, this thesis will reference both BR and MBR throughout.

1. Introduction

1.1 The Impact of Covid-19 on global tourism

From its discovery in December 2019 to the present day, the outbreak of Covid-19 has led to critical global health challenges, with more than 500,000,000 cases globally by April 2022 (WHO 2022). Within the global tourism industry, the impact of Covid-19 is unprecedented, with the sector proving completely unprepared for the virus and the halt in international travel which followed (Gössling, Scott and Hall 2020, Nagaj and Zuromskaite 2021). The Covid-19 pandemic demonstrates not only tourism's fragility as an industry but also how ill-prepared it is for this type of global catastrophic event (Yang et al. 2021).

Nonetheless, this current pandemic is not the first time the worldwide tourism sector has encountered challenges caused by world events. In the past two decades tourism has had to deal with 9/11, the 2002/3 SARs Outbreak, the 2008 Global financial crisis, and the 2013 Avian Flu, to mention but a few. In all cases, the tourism industry rebounded within a few years, maintaining for the most part the same business model; that of unsustainable growth and overconsumption of Earth's resources, leading the industry to repeat the same mistakes and encounter the same problems every time a catastrophic event arises (Higgins-Desboilles 2020). However, given the unprecedented scale, impact, and duration of the global Covid-19 pandemic, might this be an opportunity for industry change?

1.2 Sustainable Tourism

Present-day tourism is one of the most important economic activities across the globe, providing 9% of total world GDP (Scott et al. 2019) and huge financial benefits to many countries around the world (Steiger & Scott 2020). However, conventional, non-sustainable tourism has often led to economic prosperity for companies and investors, while producing little economic benefit for local communities, and large environmental and socio-cultural

costs (Weaver 2006). On a global scale, tourism has a high impact on the environment as the industry contributes to 9% of global greenhouse gas emissions (Lenzen 2018).

Concern regarding the negative impact of unrestrained tourist development led to the emergence of sustainable tourism (ST) in the 1980s. ST draws from sustainable development which is "meeting the needs of the present without compromising the ability of future generations to meet their own needs" (UN, 1987, 16). As such, ST can be defined as tourism which: "takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities" (UNWTO 2020). ST is also at the forefront of tourism industry efforts to limit the impact of tourism on climate change, through promoting local, low-carbon travel (Weaver 2006).

To note is that many stakeholders use the terms ST and ecotourism interchangeably. While similar, the two are not the same, with ecotourism prioritising the environment, whereas ST assigns equal importance to producing a positive environment, social and economic impacts (GSTC 2021). Currently, only 8% of the global tourism market self-defines as ST (Future Market Insights 2021), but most of the market has adopted ST principles to varying degrees (Weaver 2006), as tourism is reliant on a healthy environment to function (Salguiero et al. 2020).

Given the ravages of the current Covid-19 pandemic, tourism stakeholders are calling for structural change within the industry, towards a more resilient, sustainable global tourism industry (Gössling, Scott and Hall 2020, Hosseini, Stefaniec, Hosseini 2021, Chang et al. 2020, Sousa et al. 2022). Indeed, many ST researchers believe that the Covid-19 pandemic can be a catalyst for essential transformations within the tourism industry, towards a low-carbon ST (Palazzo 2022, Gössling 2020, Higgins-Desbiolles, 2020). This transformation would in turn reduce tourism's contribution to climate change and increase climate change resilience (Sheller 2022).

Preliminary research on whether the pandemic will truly lead to a transition is far from optimistic, with Hall warning that "COVID-19 may provide an impetus for individuals to transform their travel behaviours, however, the transformation of the tourism system is extremely difficult" (2020, p.9). This warning is compounded by research by Zaman et al. (2021) and Tauber and Bausch (2022). Both publications conclude that there is little indication of a move towards sustainable tourism because of the pandemic, either on an individual or collective basis.

Nevertheless, as of May 2022, it is still early to come to conclusions as to whether a large-scale transition in the tourism industry will take place, particularly as many stakeholders have struggled to survive financially over the past two years. This situation of crisis means that transformation was perhaps not of high importance. As the world ventures towards a post-Covid recovery, reflections on the crisis may yet provoke transformations towards a more sustainable industry.

1.3 Resilience

Talk of resilience is undeniably in vogue, with the world attempting to recover from the Covid-19 pandemic. Within the industry, stakeholders of all sizes from international organisations such as the World Tourism Organisation (WTO), to governments, municipalities, and individual companies discuss the necessity for tourism to become more resilient and transform, particularly within the context of a post-Covid-19 recovery.

Resilience Theory

Many studies which integrate resilience theory within the field of tourism omit a discussion on resilience theory and which definition of resilience the study employs. This is important, as resilience means different things to different people, with definitions even varying immensely within academia and beyond (Olsson et al., 2015, Hall 2018). A discussion on resilience theory which concludes with a working definition of resilience for this study is therefore essential.

The theoretical conceptualisation of resilience was first explored by C.S. Holling who defined it within the context of social-ecological systems (SES), as the "measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations or state variables" (1973:14). Resilience, therefore, is being able to deal and absorb impactful change whilst returning to the pre-impact state. Conceptually, this definition is problematic, as it leads to the interpretation that if a system can revert to a pre-crisis reality without changing, then it is resilient.

Rather than using Holling's definition, this study will use the definition provided by Folke et al. (2010) who reshaped resilience theory in their seminal article *Resistance Thinking: Integrating Resilience, Adaptability and Transformability*. The authors expand on Holling's definition by stating that true resilience is "the capacity to adapt or transform [emphasis added] in the face of change in social-ecological systems" (Folke et al. 2016). This definition implies that resilience no longer refers to absorbing a shock and rebounding to normality; a resilient system will innovate and transform, rather than reverting to its previous form.

Sustainability and Resilience

Many key authors in resilience theory discuss the importance of sustainable development and its relationship with resilience theory (Marchese et al. 2018, Holladay et al. 2013, Folke et al. 2010). Sustainability and resilience are closely related, but it is important to note that they are not synonymous (Redman 2014, Hall 2019), despite components of both being deeply embedded in sustainable tourism development (Powell, Cuschnir, & Peiris, 2009). This thesis will adapt Marchese et al.'s (2018) definition of the relationship between resilience and sustainability, which states that sustainability is a component of resilience. Therefore, the more sustainable a system is, the more resilient it is to catastrophic global events. The implication of this is that ST, which takes full account of present and future impacts while balancing economic, environmental, and social needs of the local community while encouraging broad stakeholder involvement, should be more resilient than standard tourism.

Innovation and Resilience

Innovation is the purposeful introduction of novelty into a system that transforms it. Crises often accelerate innovation (Colombo et al. 2016). Innovation in turn is key for resilience as the more innovation that is present within a system, the more options for transformation. Equally, systems that are more resilient enhance innovation options. In short, innovation is important tool in the resilience toolkit. Folke et al. (2010) discuss how transformability often derives from smaller scales that are more capable of experimenting with innovative initiatives. This small-scale innovation, if proven effective, is then adopted at larger scales, enhancing system resilience. An example of how ST innovation can be scaled up increase resilience is Costa Rica. The country piloted small-scale innovative sustainable tourism programs locally in the 1980s to replace dependency on the banana industry. By the early 2000s, Costa Rica had scaled-up ST nationally, reducing poverty and increasing forest by 7000 hectares by year. This led to the UN Programme for South-South Cooperation, where Costa Rican ST shareholders shared ST innovation and knowledge with Bhutan and Benin, who have successfully implemented their own ST programs, increasing resilience for rural communities (UNDP, 2011).

Support Networks and Resilience

Resilience requires that stakeholders are supported for transformations to take place (Zabanioutou 2020). This support can be financial in nature, or social through encouragement from other stakeholders to have the courage to transform. These support networks can be found at all scales, from the small-scale village community to national government or a global-scale international network, such as UNESCO. Additionally, networks promote resilience through communicating innovation(s) which can enhance resilience elsewhere (Ahern 2021).

Conditions for Resilience

Carpenter et al. (2012) discuss how there is currently much research being done on resilience to specific disasters (floods, volcanoes, etc.), but little on unusually intense or extensive extreme disasters such as Covid-19 or those produced by climate change. They state that these events require a broader spectrum of resilience which they term general resilience. This resilience draws on the Folke et al. (2010) definition of resilience, with the authors going on to enumerate conditions that enable general resilience during catastrophic events such as Covid-19. For them, general resilience can be indicated through system diversity, openness, modularity, reserves, nestedness, leadership, monitoring, and trust. In a similar study, Biggs et al. (2015) state the importance of maintaining diversity, broad participation, polycentric governance, and maintaining connectivity such as belonging to a network, in order to enhance general resilience.

1.4 Mountains

This thesis is mountain-focused for three reasons:

Firstly, is that mountain economies are often less economically diverse than surrounding lowland communities, due to historical isolation and an environment that is less benevolent than that of their lowland counterparts. From the 20th century onwards, mountains have drawn tourists, with 15-20% of the global tourism industry accounted for by mountain tourism (Richins et al. 2016). Many mountain communities and economies have transitioned from being dependent on resource extraction economies to dependency on mountain-based tourism, specifically within Europe and North America (Palazzo 2022). Therefore, as often non-diversified communities that are often reliant on tourism, these communities have been heavily impacted by the Covid-19 pandemic.

Secondly, mountainous regions are historically resilient, with a strong tradition of innovation due to the challenges mountain communities face, such as hostile weather, the sparseness of population, remoteness, and problems of accessibility to market (Soubirou

and Jacob 2019). This tradition of resilience has continued to the present day, as mountainous regions face global warming at a rate that can be double that of the surrounding lowlands (Price 2015), meaning much mountain research already follows a resilience-based framework. Tourism stakeholders in the Alps, for example, are well-known for producing innovative responses which help promote climate change adaptation (Alpine Convention 2013).

Thirdly, many mountainous regions champion sustainable tourism, with an emphasis on beautiful landscapes through nature-based sports such as hiking. The findings of this thesis could therefore be of importance to other mountainous regions around the world that are struggling with the impact of Covid-19 and wish to encourage sustainable tourism locally.

These three reasons make a compelling rationale for why an investigation of the impact of Covid-19 on mountain tourism should make for a thought-provoking study.

1.5 MAB Network

In 1971 UNESCO established the Man and the Biosphere (MAB) programme, to promote knowledge exchange that contributes to sustainable development through the safeguarding of ecosystems and improvement of local livelihoods. To do this, the MAB set up the World Network of Biosphere Reserves (WNBR). The largest and oldest network, EuroMAB, covers North America and Europe with 302 BRs in 36 countries.

Contrary to many similar land-use models globally, such as national parks, the WNBR acknowledges that people constitute an essential component of the landscape, leading to a focus not just on the environment, but also on local culture and economy (Reed and Price, 2020). To implement SD, BRs use the UN SDGs as a framework (Pool-Stanvliet & Coetzer, 2020) and use a system of zoning (see figure 2 below) to ensure land is managed equitably between development and conservation needs.

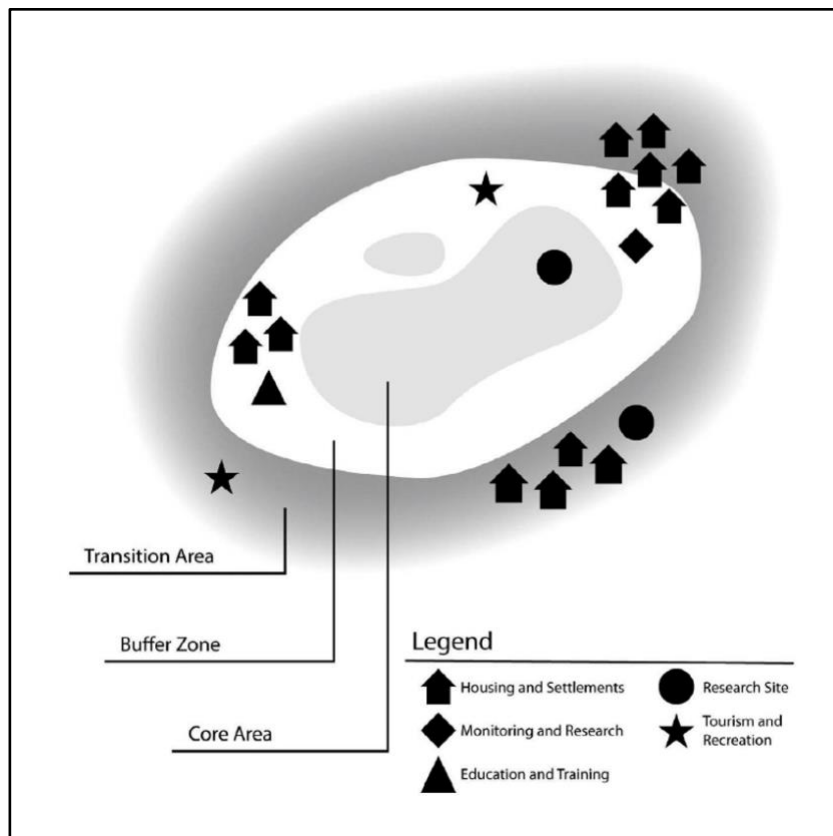


Figure 1: BR zoning layout example (Reed and Price 2020)

As such, BRs are examples of sustainable development in practice with three main functions:

- a. **Conservation** of cultural and biological diversity
- b. **Development** that is socio-cultural and environmentally friendly
- c. **Logistic support** which underpins development through research, monitoring, education, and training

Of particular interest to this study is the BR function three – logistical support, with BRs being SD 'laboratories'; inclusive, stakeholder-led learning sites within which innovative approaches for SD are put into action and tested. Knowledge-sharing is a key strength of the network, in order to share best practices amongst the network and to facilitate "global diffusion and application of these models" (UNESCO, 2017: 16). This is not to say, however, that BRs are perfect, with Schultz et al. (2018) stating that BRs still suffer from a concept-reality gap that can impede management. Additionally, Torralba et al. (2019) note that communication and support amongst the network are not uniform, with national networks within the EuroMAB differing in degrees of activeness. Furthermore, UNESCO is not

prescriptive in how BRs should be governed, again leading to variation within the network (Bouamrane 2006). Despite these issues, the BR network is nonetheless one of the only examples of a network of areas where sustainability is put into daily practice.

The MAB network currently counts 727 BRs, globally, of which 65% are situated in mountain environments (UNESCO 2022). The growing importance of mountains to the network led to the MAB programme relaunching its World Network of MBRs in 2021, to involve all actors involved in MBR research and development. One key focus is to monitor climate change as MBRs are highly impacted by global warming, leading to the loss of rare species and changes in water balance and land-use. This heavily impacts the livelihoods of local communities (UNESCO 2021).

EuroMAB MBRs all depend (to varying degrees) on sustainable tourism such as natural, gastronomic, and cultural tourism to generate finances to support BR ecological, economic, and socio-cultural objectives. Within EuroMAB MBRs, ST has been particularly efficient as a means to reverse rural depopulation and improve local livelihoods, revitalising local culture in rural mountain communities (Di Lonardo and Cinocca 2021, Mathevet and Cibien, 2019, Pantić and al. 2021, Těšitel and Kušová 2019), two principal challenges that mountain communities in developed countries face in the 21st century. MBR tourism has also been key to publicising the work of the network by helping tourists understand and take part in the three main aims of the network (MAB, 2002).

A principal criticism of resilience theory is that it is difficult to define SES boundaries, in order to carry out effective research on the resilience within SES (Olsson et al. 2015). This, as well as their commitment to sustainable tourism, makes the MAB network an appropriate candidate for research on resilience, as MBRs are boundaried and zoned, as well as being innovation laboratories on sustainability within an international network that shares interdisciplinary research and facilitates innovation up-scaling.

2. Aims and Objectives

2.1. Aim

This research aims to assess the resilience of the MAB network by studying the impact of Covid-19 on sustainable tourism on mountainous BRs (MBR) within the European Man and the Biosphere Network (EuroMAB).

2.2. Objectives

Within this aim, this study has the following objectives:

1. Discern the impact of Covid-19 on tourism in MBRs in the EuroMAB network
2. Explore MBR resilience to the impact of Covid-19 on their ST programs
3. Evaluate the importance of the EuroMAB network for MBRs during the pandemic

2.3. Research Questions

The following research questions have guided this thesis since conceptualisation. They aim to guide enquiry to better address the Aims and Objectives.

- a. What has been the impact of Covid-19 on EuroMAB MBR tourism?
- b. How have MBRs demonstrated resilience in the face of Covid-19 through their response?
- c. To what extent is this resilience related to sustainable development principles?

d. To what extent has belonging to the EuroMAB network helped MBR Covid-19 resilience?

e. Are there examples of MBR innovation arising from the Covid-19 pandemic?

3. Literature Review

This section explores key literature relating to the impact of Covid-19 on sustainable tourism around the world. Through the critical analysis of 15 papers and reports of differing designs and characteristics, themes are identified and explored. Appendix 2 provides an overview of the literature review in table format. It is worth noting that this literature review looks only at empirical papers, such as case studies, as conceptual literature is discussed in section 1. The aim is to create an overview of how sustainable tourism has been influenced by Covid-19 and to generate themes and information which would inform research methods.

3.1 Existing Literature Reviews

Existing literature reviews were hard to come by, due to the novelty of Covid-19 and the fact that it takes time for research to be submitted, peer-reviewed and accepted. As a result, (as of March 2022), there are only a few important research papers on the impact of Covid-19 on selected fields of sustainability (Krellenberg 2021). The lack of empirical research is especially pronounced in the Global North (Europe and North America), where there are only 4 articles of relevance to this literature review. This is surprising within the overall context of academic research, with the Global North averaging 80% of total global publications (Albanna et al. 2018).

Focusing on ecotourism and Covid-19, Fernández-Bodoya et al. (2021), conducted a review of academic papers throughout the world. They found 13 relevant papers relating to ecotourism and Covid-19. Of these, 7 focused on the impact of Covid-19. The author's research was key in indicating current global research on the impact of Covid-19 on tourism and contains several of the same articles as this study (Castanho et al. 2020, Cherkaoui 2021, Karagiannis and Metaxas 2020, King, Iba, & Clifton, 2021).

3.2 Impact of Covid-19 on Sustainable Tourism

Unsurprisingly, all studies within the literature review depicted the same story of tourism stopping suddenly with the arrival of Covid-19 and government measures put in place to control the spread of the virus. While all have been impacted, the impact varies, depending on the country, and date of publication.

For example, there is a difference in overall perspective on the impact of Covid-19 on sustainable tourism depending on the year of publication. Those of 2020 such as McGinley et al. (2020) and Cherkoui et al. (2020) focus more on impacts, whereas those from 2021 and 2022 provide a more nuanced view of the pandemic, drawing out some unexpected results, such as Tlali and Musi (2021) or King et al. (2021). This thesis, for example, which takes place in Spring 2022, will be different again to previous research, as the pandemic starts to wane.

Case studies in this literature review are all empirical research, with conceptual papers being discussed in the thesis introduction. Case studies are presented geographically divided by continents to structure their presentation, with a thematic discussion of them taking place in 3.4. Structuring case studies by continent provide an opportunity to highlight global differences. This approach is relevant in the context of reviewing a global impact.

3.4 Case Studies

Europe

In the Azores, Portugal, **Castanho et al.** (2020) ran a case study looking at the impact of Covid-19 on tourism expectations of Azores residents to discover the public confidence in the future of tourism on the islands. The authors conclude that the crisis opens a window of opportunity for the growth of resilient, sustainable tourism – agritourism, nature, sport, rural, adventure and cultural tourism to name but a few.

In Greece, **Karagiannis and Metaxas (2020)** provide a case study on gastronomic ecotourism on the Peloponnese peninsula. The authors found that Covid-19 has forced wineries to come up with innovative strategies to stay afloat through the pandemic. They have done this through the support of winery networks and through adding local gastronomy to the tastings, which increases average spending. The authors conclude that this innovation means that the Peloponnese ecotourism wine industry is well placed to get through the pandemic and grow as a tourist destination.

In a similar study to Karagiannis and Metaxas, **Kastenholz et al. (2022)** analysed the effects of the COVID-19 pandemic in two wine tourism regions in Portugal and Spain, by interviewing vineyard owners. Interviewees did not follow sustainable development principles. The authors discovered that all stakeholders were struggling due to rural tourism's 'inherent weaknesses' – lack of partnership, networks, and lack of skilled governance led to uncertainty and passivity, preventing innovation and economic sustainability. They also noted that participants felt disillusioned by the lack of local and national guidance and assistance from government.

McGinley et al. (2020) researched the impact and response of 14 Nature Protected Areas tourism in Europe. They found that the NPAs have been subject to over-tourism in Summer 2020 due to an increase in national and regional tourism. This compromised sustainability due to the overuse of park sites and littering. They conclude by proposing 3 innovations to manage numbers: spatial planning, educational campaigns and promoting sustainable tourism models.

In the MAB network, the **UNESCO Regional Bureau for Science and Culture in Europe (2021)**, conducted mixed-methods research on the experience and resilience of Italian UNESCO BR and Geopark stakeholders during the Covid-19 pandemic, to assemble creative resilient solutions to share amongst the network. While the report is forthcoming, the office provided a draft copy. The results demonstrated that tourism was by far the sector the most economically affected by Covid-19. Nonetheless, the authors perceived new opportunities due to the increase in proximity tourism, with opportunities for the

return of young people to the regions and for the implementation of the European Commissions' Smart Tourist Destinations which encourages digital innovation.

Middle East

Abdallah and Kataya (2021) provide a case study looking at the impact of Covid-19 on sustainable tourism within the Al Shouf BR in Lebanon. The authors discovered that there had been a significant negative impact on the tourism industry and local communities, with a loss of international tourists. However, they also discovered that due to the BR's adherence to sustainable development and sustainable tourism, the BR saw a rise in national tourism, with Lebanese citizens seeking to reconnect with nature. This demand also led to a quick diversification of the tourist offer, which was formerly dominated by summer mountain sports such as hiking, specifically with agrotourism offerings increasingly significantly.

Africa

Cherkaoui et al. (2020) discuss the impact of Covid-19 on ecotourism in the Atlas Mountains of Morocco. The authors found that the result has been catastrophic, due to ecotourism projects being underfunded and reliant on international tourism. The moment the international tourists could no longer come to Morocco due to the pandemic, communities were heavily impacted. Due to a lack of government support, communities reverted to poaching and illegal farming within the parks, which negatively impacted wildlife conservation. The authors conclude by stating that for ecotourism in Morocco to recover, it needs to become more diverse and look for other networks of support as the government is not reliable.

Tlali and Musi (2022) looked at the effects of Covid-19 on ecotourism in Lesotho at a local ecotourism venture, which is the principal employer of the community surrounding it, with strong inter-reliance between the venture and community. The authors found that the impact of Covid-19 had strongly restricted the efficiency of the venture to provide financial

and social support to the community as the many outreach programs that it supported were reliant on funding from international tourists. Despite this, the fact that the venture was based on sustainable tourism principles with a bottom-up approach involving all stakeholders meant that participants could mobilise local resources and innovate to tap into the local tourism market. This led to self-empowerment and increased self-worth. The authors conclude by stressing the need for more government intervention and networks of support.

North America

Broker-Bulling (2020) conducted MSc thesis research on the impact of Covid-19 on tourism stakeholders in Bend, Oregon. The author conducted 11 stakeholder qualitative interviews and then thematically analysed the data. She found that the overall resilience of stakeholders varied immensely. For example, those who managed to successfully transform through innovating their business model had three key factors: internal emergency funds, a diversified business model and connection to networks (formal and informal). Those that had these three factors could make drastic pivots and recentre on new opportunities such as the increase in local/regional tourists. Those who did not, struggled to survive or stopped operating completely.

South America

Gabriel-Campos et al. (2021) discuss the impact of Covid-19 on community-led ecotourism in the village of Quebrada Verde in the Peruvian Andes, which has been instrumental in increasing community resilience to the impacts of climate change. The authors found through a series of semi-structured interviews that the community had been economically heavily hit by the disappearance of international tourists, on which they were dependent. Nonetheless, these impacts were lessened for ecotourism stakeholders, thanks to the strength of the community which possesses a cohesive social structure and solid cultural identity rooted in its customs and traditions. Moreover, for the community to be more

resilient, it needs to diversify to local/national tourists and join networks to learn innovative methods to increase tourism resilience.

Galas et al. (2022) assessed the impacts of Covid-19 on the newly formed Colca y Volcanes de Andagua UNESCO Global Geopark in Peru. They found that UNESCO cooperated closely with the Peruvian government and the Geopark stakeholders to help support the local community. UNESCO used innovative digital forums to help share best practices from different Geoparks, helping Geoparks adapt to Covid-19. Despite this support, the authors nonetheless noted that the pandemic led to serious socio-economic losses and the inhibition of sustainable development and a return to the 'old style of living'. They conclude by stating that UNESCO needs to provide more support for the park to transform.

Asia

Shresta and Decosta (2021) interviewed Nepali ecotourism stakeholders. Their aim was to assess community collaboration and look at how tourism can innovate within the pandemic. The authors found that stakeholders had suffered due to an overdependence on international tourism and that community collaboration was weak, due to a hierarchization before the arrival of Covid-19 which marginalised poorer stakeholders. This impacted ecotourism resilience. Additionally, stakeholders have struggled during the pandemic due to a lack of government support, highlighting the need for more networks of support. Nonetheless, the authors see Covid-19 as an opportunity, as the pause helped communities reflect on best practice and acknowledge that all stakeholders need to be integrated for better resilience and innovation.

Pacific

King et al. (2021) discuss resilience in Indonesia looking at the situation of post-pandemic marine tourism in Wakatobi National Park. Through a qualitative research approach, they compared three types of sustainable tourism operations through the lens of resilience, to find out how operations fared with the pandemic (see table 2). They found out that the

operation which did the best was homestay-based tourism, which was the only type to not exclude the local community. Homestay tourism encouraged and empowered local community members, and was also more diverse, targeting domestic tourists, rather than 'elite' international tourists. However, the authors mention that due to a lack of governmental and ecotourism network support, homestay tourism would likely stay marginalised, highlighting the need for networks of support.

Scheyvens et al. (2021) conducted case studies on the impact of Covid-19 on sustainable tourism on 5 islands in the Pacific. They found out that while the communities involved had suffered a considerable loss of tourists to their respective economies, conversely all the communities stated that their spiritual, mental and community wellbeing increased due to the pause in tourism. This demonstrates that the impact of Covid-19 on sustainable tourism is not always negative and that the slow-down in tourism can in some respects be advantageous to communities, as an opportunity to take a breather and reflect on the future.

3.5 Thematic Discussion

While not intentionally using resilience theory to identify themes within the literature review, it is striking that all emergent themes are linked to resilience and correspond to resilience indicators in section 1.3. The impact, while overall negative, can provide some unanticipated opportunities, as well as challenges for sustainable tourism stakeholders. Impact themes are multi-faceted and overlapping. Additionally, these themes interconnect and are not independent of each other. That is to say that the presence of one, correlates with others. These themes were used in conjunction with a combined list of resilience indicators (see 3.4) to create the survey question.

Within **community**, we can see the importance of having a bottom-up hierarchy, with community empowerment being key to resilience (King et al. 2021, Gabriel-Campos et al. 2021, Scheyvens et al. 2020, Broker-Bulling 2020). Conversely, sustainable tourism stakeholders who excluded communities before the pandemic have suffered from a lack of

support, as communities did not see themselves as stakeholders (Shresta and Decosta 2021, King et al. 2021). Those who have subsequently increased community engagement (Tlali and Musi 2022) have seen support, empowerment and innovation increase as a result.

Diversity is a key theme throughout the review. Tourism stakeholders which have diverse activities (for example gastronomic and adventure tourism) and diverse tourists (international, national, regional, local) have better outcomes and show higher resilience (Abdullah and Kataya 2021, Castanho et al. 2020, Karagiannis and Metaxas 2020, Tlali and Musi 2022, Broker-Bulling 2020). On the other hand, case studies where tourism stakeholders are highly dependent on international tourism (Galas et al. 2021, Shresta and Decosta 2021 and Cherkaoui et al. 2020) are comparatively more impacted by Covid-19.

We can also see that **government** has considerable influence on the impact of Covid-19. This varies from nation to nation. Seven case studies were critical of government support and funding to help tourism stakeholders get through Covid-19, stating that government was not doing enough (Abdallah and Kataya 2021, Cherkaoui et al. 2020, and Galas et al. 2021, Karagiannis and Metaxas 2020, Kastenholz et al. 2022, Tlali and Musi 2022, and Shresta and Decosta 2021).

All authors spoke of the need for **networks** for much support. This support can be for sharing best practices (Kastenholz 2020), igniting innovation (Karagiannis and Metaxas 2020), providing financial support (Cherkaoui et al. 2020) and transcending a lack of governmental support (Shresta and Decosta 2021). Of particular interest are Abdallah and Kataya (2021) and Galas et al. (2021), who indicate that belonging to a UNESCO-based network has been a beneficial contributor to resilience, something demonstrated by UNESCO (2021), where Italian stakeholders shared concerns and solutions.

Innovation is another key theme, with the ability to innovate allowing for transformation and resilience. Of particular interest within the studies is the juxtaposition between Karagiannis and Metaxas (2020) and Kastenholz et al. (2022). Whereas the former study showed innovation, by forming networks of support and introducing gastronomic dining to

supplement income, the latter shows how a conservative mindset impeded innovation and, by consequence, stakeholder resilience. The ability to innovate seems heavily reliant on certain other themes, specifically community and networks, as evidenced in the Tlali and Musi (2022) study. McGinley et al. (2020) demonstrate how innovation could help keep Nature Protected Areas sustainable in Europe, which is supported by UNESCO (2021) which highlights the pandemic as an opportunity for transformation.

Finally, following **sustainable development principles** seems to support resilience, as suggested by Marcese et al. (2018) in section 1.4. These principles include an emphasis on future proofing, as demonstrated in Broker-Bulling (2020), a focus on stakeholder inclusivity (Tlali and Musi 2022) and community-led initiatives (Gabriel-Campos et al. 2021). Of note, too, is that the one study which did not refer to sustainable tourism/ecotourism (Kastenholz et al 2022), described stakeholder passivity and lack of innovation faced with the impact of Covid-19.

3.6 Conclusion

Fifteen empirical studies were reviewed, with communal themes related to resilience and Covid-19 emerging: innovation, networks, community, sustainable development principles, government and diversity. Three studies (Abdallah and Kataya 2021, Galas et al. 2021 and UNESCO 2021) indicate that belonging to a UNESCO network such as the MAB had been beneficial for Covid-19 resilience.

Despite these important case studies, there is a clear current lack of empirical data studying the intersection of resilience, Covid-19 and sustainable tourism. This is especially important as governments and stakeholders discuss the importance of resilience for future tourism. There is also a need for more academic studies on the impact of Coronavirus on sustainable tourism. This is unsurprising but does not reduce the necessity.

In summary, the literature review provides key themes and demonstrates that there are knowledge gaps (as supported by Fernández-Bodoya et al. 2021), with the following areas in need of additional investigation:

1. What the impact of Covid-19 has been on sustainable tourism
2. How networks play a role in supporting resilience
3. What the role of sustainable development is in supporting resilience

These lines of investigation shall be researched within this thesis through researching the impact of Covid-19 on EuroMAB MBR resilience, with the questions and literature review informing the survey methodology in section 4.6.

4. Methodology

4.1 Research Background

After scoping several potential topics and conducting limited-sized literature reviews, the decision was made in October 2021 to conduct research into the impact of Covid-19 on tourism within the global UNESCO Man and the Biosphere network. The research took place from October 2021 to May 2022. The research process is shown in Table 2, below.

	November	December	January	February	March	April	May
Literature Review							
Survey Creation							
EuroMAB Approval							
Ethical Approval							
Briefing Conversation							
Approach Contacts							
Conduct Survey							
Analysis							
Write thesis							

Table 1: Gantt chart of MSc thesis stages

Background research: Upon agreement of the research topic following the presentation of the research proposal, a focused literature review was conducted to deepen researcher knowledge, draw out themes and create questions for the survey.

Approval: This second stage focused broadly on creating the survey and relevant documents to gain approval and the UHI ethics committee and permission to contact MBRS from the EuroMAB central office.

Collection: A briefing conversation was held to learn more about the EuroMAB. Contacts were approached in January and February to assess study relevance. The online survey using JISC Open Survey Software (2022) started on February the 15th and closed on the 1st of March (2 weeks).

Analysis: data analysis and interpretation were conducted in March-May parallel to thesis write-up and completion.

4.2 Study Design

This study aimed to explore the impact of Covid-19 on tourism within MBRs in the EuroMAB network, looking specifically at the impact through the lens of resilience and innovation.

Due to the constraints of 15,000 words and the relatively short time research periods, MSc theses are time and scope limited. Participants in this research are from across Europe and North America and are principally managers and directors, who often have limited time to allot to researchers. It was therefore decided that a single survey would be used which would contain both quantitative and qualitative (open-ended survey responses) questions, negating the need for interviews with time-sensitive respondents.

Bamberger (2012) states that combining qualitative and quantitative questions within a survey can be especially useful for impact research projects within a limited timeframe and scope. Quantitative questions provide generalised, objective data that can be communicated through statistics within the study. Qualitative questions were used for two purposes. The first, to follow-up to closed-ended quantitative questions to understand their choice. The second, when asking about complex constructs such as the relationship between sustainable development principles and resilience.

Table 2 provides a summary of study goals and which methods were used to achieve them.

Goal	Methods	Outcome	Justification
Understand the impact of Covid-19 on sustainable tourism	Literature review of peer-reviewed papers Analysis of survey results	Gain a deep understanding of the impact of Covid-19 on sustainable tourism projects	The literature review provided a contextual foundation which develops the survey
Understand more about the MAB network	Background research Briefing with UNESCO SMD Chair	Knowledge level increased with a more nuanced understanding of MAB network and relationship with sustainable tourism	Need to understand how MAB network works before engaging
Explore the relationship between sustainable tourism and resilience	Literature review Analysis of survey results	Understand MBR perspective on the relationship between sustainable tourism and resilience to catastrophic global events	Literature review details current knowledge Preliminary analysis built on lit. review key themes Extra inductive themes produced from result analysis

Table 2: Summary of the study goals, methods, outcomes and justification for each study objective

4.3 Literature Review

Keywords were identified in the background research phase of this thesis. These were then used for the final search (Table 3) on both Scopus (2022), Google Scholar (2022) and the UHI library Multisearch engine (2022).

Search 1	Sustainable Tourism OR Ecotourism OR Responsible Tourism OR Mountain Tourism OR Alternative Tourism
AND	
Search 2	MAB OR Resilience OR Biosphere Reserves
AND	
Search 3	[Covid-19 OR Coronavirus] Impact

Table 3: Literature review search strategy

This search yielded 96 results. 32 duplicates were removed, and titles and abstracts were screened for relevance, providing 64 papers. Afterwards, exclusion and inclusion criteria

were applied (Table 4), and 7 papers were removed due to non-relevance, taking the final total to 15.

Inclusion criteria	Exclusion criteria
Qualitative, quantitative, or mixed methods study/review study	Opinion piece, commentary or different studies not reporting primary data/reviewing existing data
Study available to download	Study available as an abstract
Must discuss the impact of Covid-19 on tourism	Study mentions Covid-19 but is not focused on it
Study on ST/Ecotourism	Study on large-scale tourism
Academic journals, dissertations, reports	Magazines, conference materials, books
Study available in English or French	Study not available in either language

Table 4: Literature review inclusion and exclusion criteria

Figure 2 below summarises the literature review selection process.

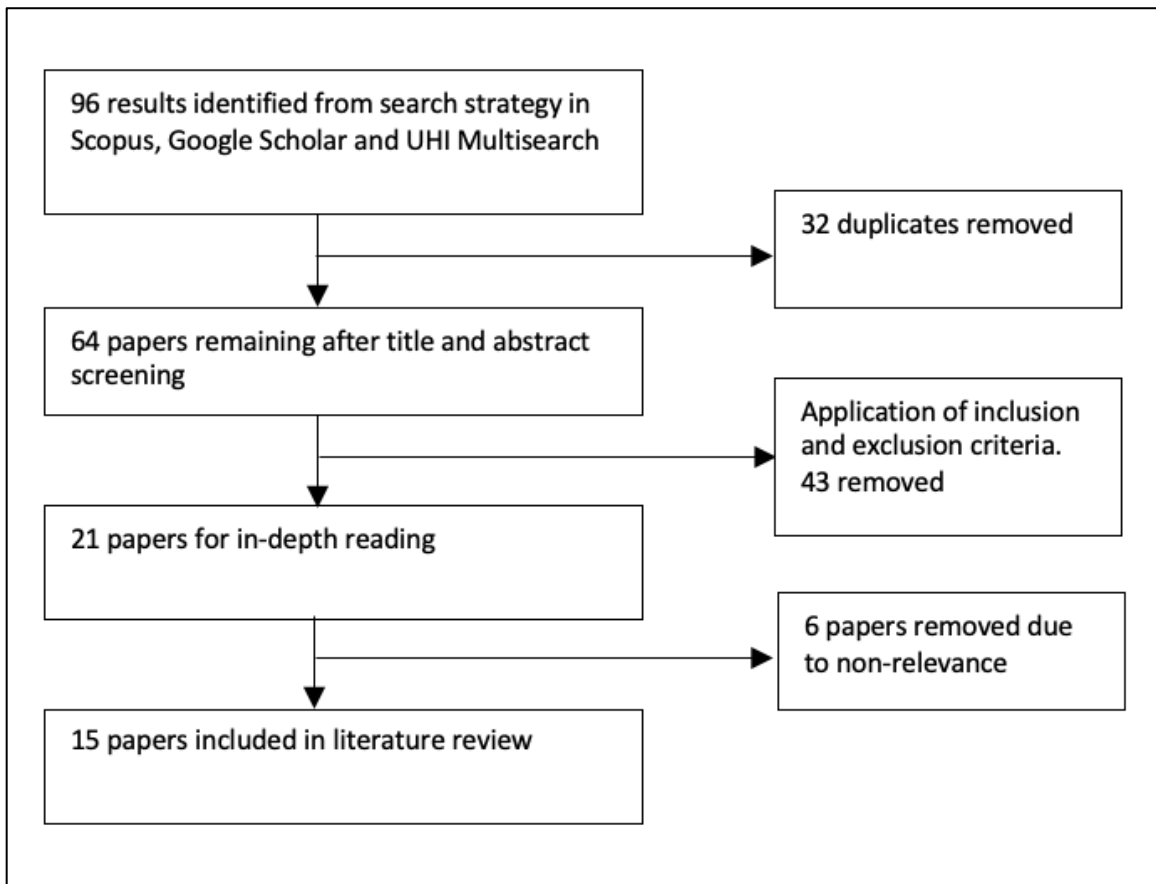


Figure 2: PRISMA flowchart of the literature review selection process

Themes were drawn from the papers deductively based off resilience theory and then formulated into data in Microsoft Excel (2022). Afterwards, the data was collated, then analysed and summarised in the literature review.

4.4 Briefing Conversation

A briefing discussion on the MAB network was conducted in January with Martin Price, the former head of the Sustainable Mountain Development MSc at UHI, and the UNESCO Chair of Sustainable Mountain Development. This discussion led to a better understanding of how tourism and BRs interact, and how best to contact BRs. Dr. Price also kindly provided a database which lists all EuroMAB MBRs which was invaluable for preliminary sampling. Following this, approval to use the database and contact the MBRs was then sought and granted by contacting Mary Cardenas, Associate Programme Specialist for MAB Research and Policy: Ecology and Biodiversity.

4.5 Study Setting

As noted in section 1.5, the MAB BR network is a global network which engages in and champions sustainable development. Within the MAB network, 474 (65%) out of 724 BRs are in contain mountain ecosystems within their area. The network uses the UNEP-World Conservation Monitoring Centre definition of mountains, based on the research of Kapos et al. (2000). This defines mountainous regions as having a local elevation range of >300 metres in land which is over 300m above sea level.

The impact and progression of Covid-19 have been disparate and uneven globally (Hassoun 2021). However, countries in Europe and North America have had relatively similar progressions through the pandemic and have well-developed, economically important tourism economies (Palazzo et al. 2022). Due to the limitations in the size of this research project and the disparateness of the impact of Covid-19, this research focuses only on the EuroMAB network, as shown in Figure 3.



Figure 3: Map of EuroMAB member countries

Because of the high number of BRs in EuroMAB network (306 out of 727 BRs globally), UNESCO divides the EuroMAB into the following Europe-based subregions to facilitate statistical analysis, which is pertinent for this study. These subregions are highlighted in Figure 4. North America has no sub-regions and goes by its name (North America).

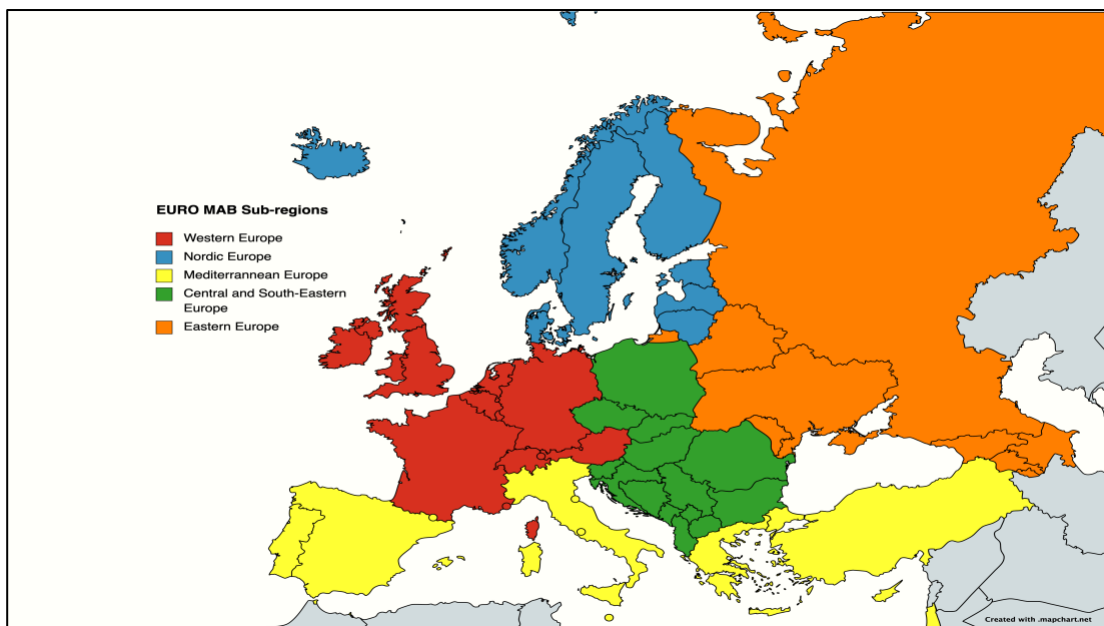


Figure 4: European subregions in EuroMAB

Table 5 below indicates the number of MBRs per subregion and their contribution as a percentage to the overall EuroMAB number (157). Note that there are 45 alone in Spain.

Subregion	Number	% of total EuroMAB MBRS (157)
Western	23	15
Mediterranean	67	43
Eastern	21	13
Nordic	3	2
Central and South-Eastern	21	13
North America	22	14

Table 5: Number of MBRs per EuroMAB Subregion

4.6 Survey questionnaire

The online survey (Appendix 2) integrated the themes generated from both the literature review and resilience theory (Folke et al. 2010). These are mapped out in figure 5.

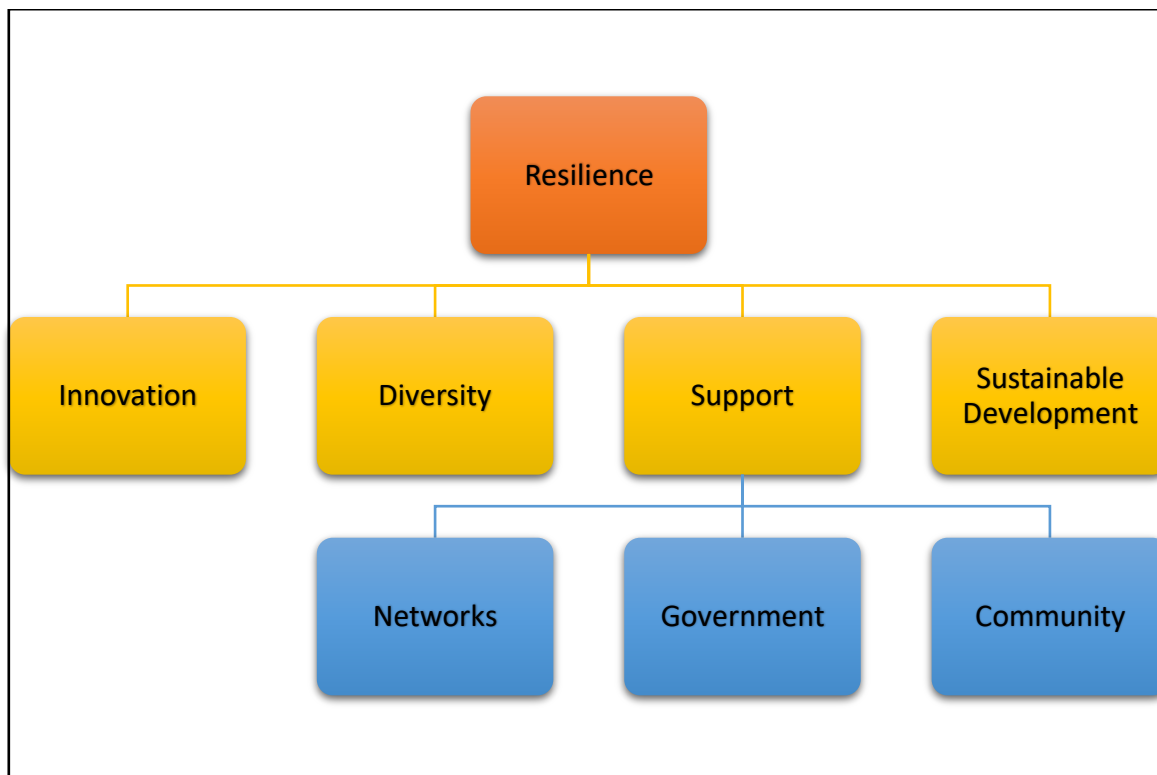


Figure 5: Proposed hierarchy of themes in relation to Resilience (overarching theme)

These themes were then integrated into the following questions.

Theme	Question
Diversity	4, 5, 6, 7, 14
Sustainable Development	14, 15
Resilience	9, 13, 14, 15
Innovation	19, 20, 21
Support	10, 16, 17, 18, 22

Table 6: Survey Question Summary

Indicators from Carpenter et al. (2012) and Biggs et al. (2015) were combined into Table 7 and integrated into questions relating to resilience for the survey. See section 1.3 to refer to the authors and conditions.

Resilience Indicators	Positive Indicators	Negative Indicators
Diversity of sustainable tourism types (e.g., rural, cultural, adventure, gastronomy)	High diversity, all year-round tourism	Low diversity, overdependence on one type
Diversity of tourist types (e.g., international, national, regional, local)	High diversity in tourist types	Overdependence on one type (e.g., International)
Versatility and responsiveness to external changes (innovation)	Innovative and open to change	Resistant to change
Impact of tourism on local communities	Positive impact of tourism on local communities	Negative impact of tourism on local communities
Participation from stakeholders	Broad and inclusive stakeholder participation	Exclusive and narrow stakeholder participation
Connectivity	Network provides support, engagement with peers	No/limited network support, little/no engagement with peers

Table 7: Resilience indicators used in study

Out of the 39 total questions (22 main questions plus 17 sub-questions), 16 were quantitative and 23 were qualitative. A typical question starts with a quantitative question, followed by a qualitative sub-question asking participants to explain their response.

4.7. Sampling

Being a master's thesis, and consequently of limited scope and duration, it was decided that the survey would aim to obtain 30 responses. This number was chosen based on the fact that the survey questions are predominantly qualitative, with Leavy (2017) suggesting that qualitative studies should contain upwards of 20 participants. Furthermore, 30 ensures that a good proportion of the study group is sampled, allowing conclusions to be drawn on the MBR network.

To obtain 30 responses, it was decided that the survey would be distributed to 50 BR representatives. This number was chosen based on research by Gower (2021), who conducted a survey with participants from the MAB network and received a 60% response rate. Hence the choice of 50 for 30 responses in this study.

Reducing this number down to 50 respondents was done through purposive sampling in a multi-staged process. Purposive sampling is a non-probability sampling method where one selects respondents through a process of filtering according to specific qualities, such as knowledge and expertise. Figure 6 below provides PRISMA flowchart, and the steps below provide the criteria. As seen in 4.3, different countries within the MAB network have different numbers of BRs. For the study, therefore, it was more important to obtain a diversity of country responses to represent the MAB network, than to ensure that a proportionate number of BRs per country are obtained.

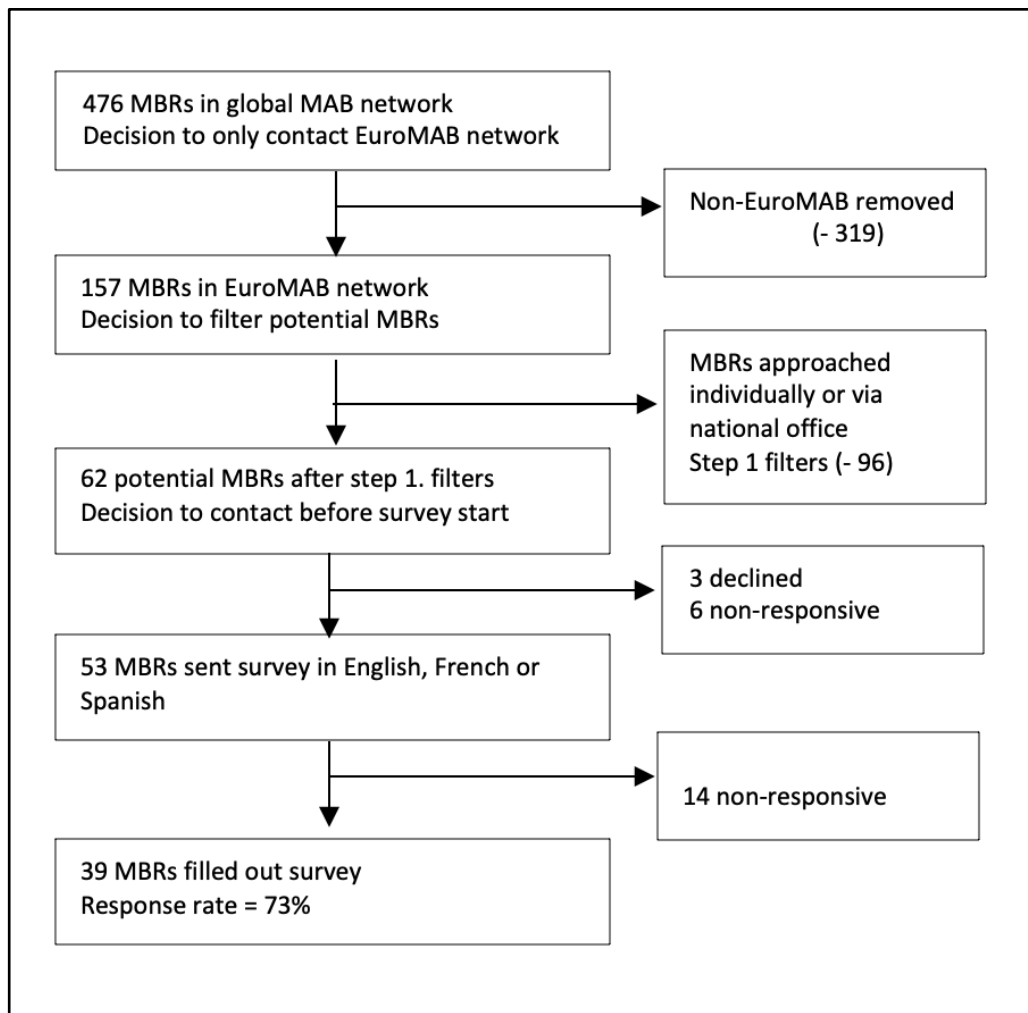


Figure 6: PRISMA flowchart of sample

Step 1 – purposive sampling

To reduce the 157 EuroMAB MBRs down to 50, several sample ‘filter’ steps were created. As the research focus is on sustainable tourism, it was important to ensure that each of the 157 MBRs had tourism as a strong element of the local economy.

This step led to the following filters:

- MBR has tourism as a key economic motor
- Participant is involved in tourism management in the reserve

This was conducted through two methods: the first, contacting the national committee MAB office and asking which MBRs were most relevant, followed by contacting the proposed MBRs. The second, contacting directly individual MBRs. The decision on which contact method to use was based on the number of MBRs within each country. MBRs in countries with <4 MBRs were contacted directly. In countries with >4 MBRs, the national MAB office was contacted who then proposed 3-6 MBRs for their country, to ascertain who would be most suited to reply to the survey.

This filtration led to the 158-strong list of MBRs being reduced through purposive filtering through criteria to 50 potential MBRs all with suitable contacts by mid-January.

Step 2 – contact

Before the 15th of February launch date, all 62 MBRs were contacted to avoid sending cold emails on the launch date. Responses were overwhelmingly positive with a clear interest in the subject matter. Out of the 62, 3 declined, citing lack of time or lack of tourist presence. Another factor which reduced the total number of respondents was non-functioning emails for MBRs in Eastern Europe, for a total of 6. This led to a total of 53 MBRs.

As the original aim was to create a respondent list of 50 MBRs, this number was satisfactory and no additional MBRs from the original 157 were contacted.

Step 3 - survey

53 BRs were sent the survey on the 15th of February. The survey was in three languages: English, French and Spanish. Of the 53 respondents, 39 filled out the form, giving an unanticipated 73% response rate – which is 24% of the total EuroMAB 157 mountainous BRs. No reason was given for why the remaining 14 respondents did not fill out the form. 5 Eastern (Russian/Ukrainian) MBRs had agreed and were sent the survey (which would

have been representative of Eastern Europe MBR overall contribution). Three did not reply and this may be linked to the Russo-Ukrainian war which started in February 2022.

Final respondents

Table 8 below provides an overview on the participating MBRs as divided by sub-region. The table demonstrates that most of the subregions were represented roughly in the same proportion in the survey as they are in the overall 157 MBRs in the EuroMAB network. The exception to this is Western Europe which was significantly over-represented (35% in the survey as opposed to 15% in EuroMAB network). This can be attributed to ease of access and good English/French levels.

Subregion	Number	% of total participants	% of total EuroMAB MBRs
Western	14	35	15
Mediterranean	14	35	43
Eastern	2	5	13
Nordic	1	2.5	2
Central and South-Eastern	4	10	13
North America	4	10	14

Table 8: Participating MBRs by subregion

4.8 Data Strategy

A top-down concurrent triangulation approach was used for the analysis of the survey data. Working iteratively and intuitively, data was analysed through the following steps:

1) Familiarisation

Data from Jisc Online Surveys (2022) was exported into Microsoft Excel (2022) and then repeatedly read over a period of two days.

2) Analysis

Qualitative and quantitative questions were concurrently analysed.

- a) Qualitative: responses were firstly associated deductively using the theme structure from the literature review. Thematic analysis was then used to generate sub-themes from open-ended survey responses (Braun and Clarke 2012).
- b) Quantitative: data was analysed in Microsoft Excel on a question-by-question basis and charted. Additionally, data was cross-tabulated with other questions when relevant, to draw out commonalities and differences.

3) Interpretation

Analysed and written up data was then interpreted and cross-compared with data from the literature review and the conceptual theory from the introduction.

4.9 Dissemination of Findings

Study results will be presented to all participating MBRs. It is intended that the study be published.

5. Results

5.1 Participant/BR Background

Figure 7 shows the location of the final participants. The complete list of participating MBRs can be found in Appendix 1. Nineteen countries participated, encompassing all countries containing MBRs, except for several Eastern and South-Eastern European countries. Of the 39 BRs, 5 were transboundary, with two covering MBRs in Portugal/Spain, one in Poland/Spain, one in France/Germany and one in Russia/Kazakhstan.

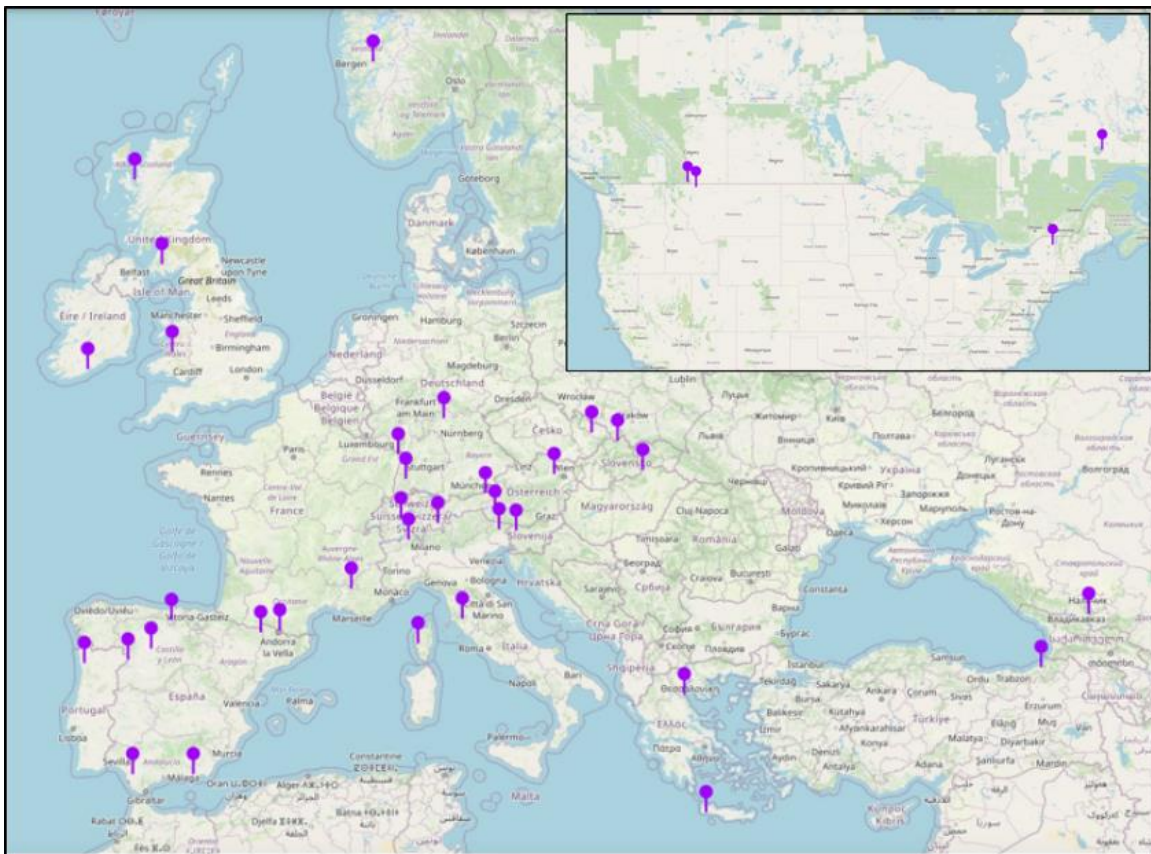


Figure 7: Map of participating MBRs in Europe (excluding Katunskiy BR/Great Altai TBR) and North America (From West to East: Waterton BR, Crown of the Continent BR, Adirondacks-Champlain BR and Manicouagan-Uapishka BR)

Participants were asked how many years the MBR had been involved in tourism. Out of the respondents, 51% (n=20) have had tourism in their BR for over 40 years. Only 25% (n=10) have had tourism for less than 20 years.

There was no relation between a BR's geographic location through subregion and the length of time tourism has taken place. Overall, the statistics demonstrate that most of the MBRs which participated in the survey have a strong history of tourism.

Participants were asked to provide their job titles to assess their position within their MBR. Job titles varied due to the question being a single line free text. 74% of all respondents (n=29) were in senior roles related to management or direction. 26% (n=10) were in junior roles, specific to tourism, whereas the more senior roles were often more generalist.

Interestingly, two respondents were not BR directors, but country managers. They did nonetheless reply for the MBR in question, and both provided important insights. The dominance of senior roles along with the specialisation in tourism of those in junior roles suggest that the participants were well positioned to respond to this study.

5.2 Impact of Covid

MBR tourism experience since the pandemic

As noted in section 1, the impact of Covid-19 has been unprecedented in global tourism. Figure 8 demonstrates these differences in the impact from Covid-19 on MBR tourism, with many MBRs suffering from a combination of undertourism and overtourism:

There is no relationship between where the MBRs are and which response they selected, although 65% of all Western European respondents selected overtourism and 35%, both undertourism and overtourism (total 90%). Out of the 5 MBRs which replied with "not enough tourists", 4 are in the Mediterranean region (Camili, Sierra Nevada, Valles de Omaña y Luna and the Gorge of Samaria), and one in North America (Manicouagan-Uapishka). All 5 are in rural, peripheral areas and have small local populations.

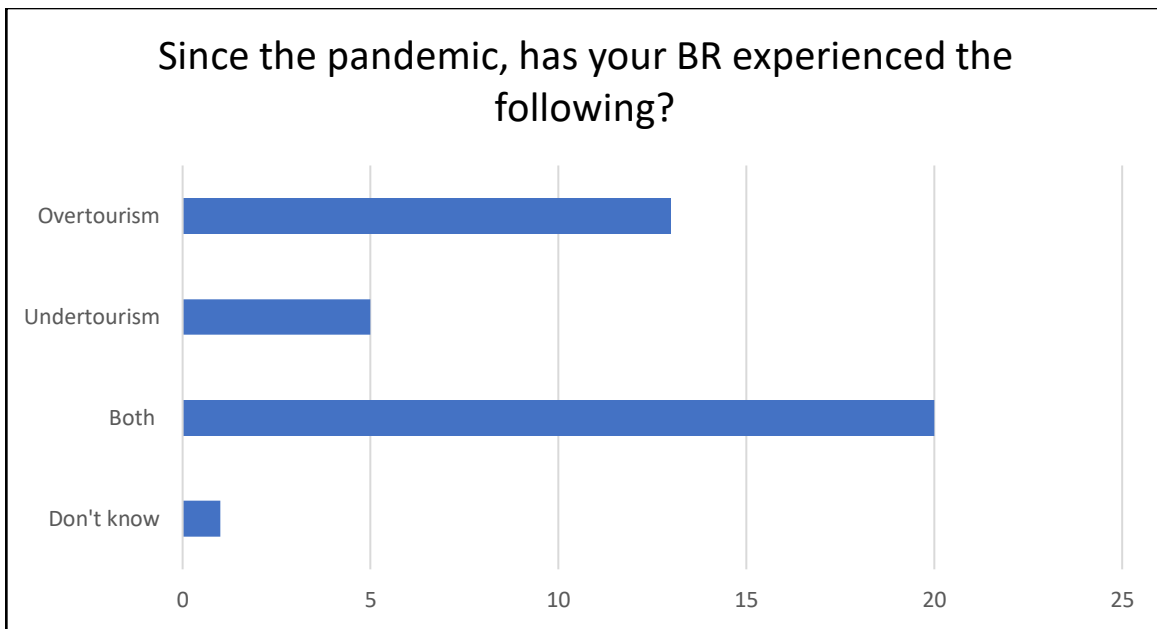


Figure 8: MBR tourism experience since Covid-19

Covid-19 'stage'

Not only has the impact of Covid-19 been different within the EuroMAB network, but so has the 'stage' within which the MBRs found themselves in March 2022 when completing the survey. Understanding how BRs have progressed is a useful indicator of BR confidence related to the impact of Covid-19. The three choices were *Actively responding to the current situation (A)*, meaning that the BR is still heavily impacted by Covid-19, *Recovering (R)*, meaning that it is getting back to normal, and *Back to business-as-usual (B2B)*. Respondents were invited to choose multiple options if they felt that different parts of their BR were at different stages. This led to figure 9, which combined responses.

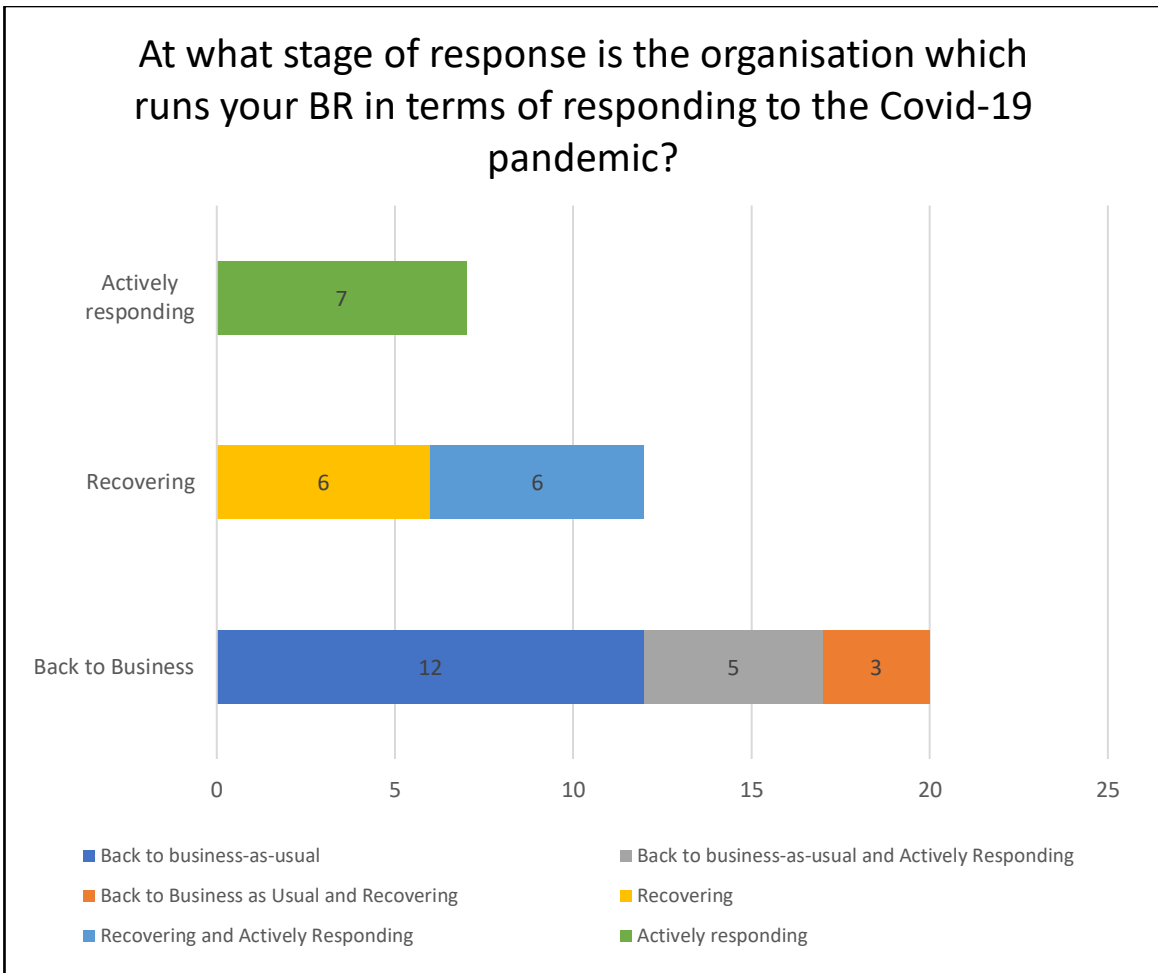


Figure 9: Current Impact of Covid-19 amongst participants by stage

Results show that when the survey was live in March 2022, 51% of MBRs were confident that they were back to business as usual (n=19), of which 8 felt parts of their BR were in a different stage. 15% (n=6) believed that they are still recovering, of an additional 9 felt they were recovering as well as either being B2B or A. Finally, 18% (n=7) selected actively responding to the current situation, with an additional 11 combining with another impact, indicating that an overall 18% of the network were still struggling either wholly or partly with the effects pandemic. There were no key trends in sub-regions, other than all North American BRs being in Actively responding (n=3) or Recovering (n=1).

The result demonstrates that although there is confidence amongst the network, many were struggling with Covid-19-related problems in March 2022 and that even among those who believe that their MBR is back to business as usual, many still have parts of their MBR which are recovering or actively responding to Covid-19.

Prospects

Despite the difficulties that many participants were experiencing in March 2022, when asked how they thought tourism in their BR would recover from the impact of Covid–19, specifically, whether it would go back to normal, recover, but be different, or not go back to normal, the result was very positive. All believed that tourism would come back, with an almost 50/50 split among respondents as to whether it would go back to normal or recover but be different.

All sub-regions were equally divided, with the exception of both Russian MBRs selected that it would go back to normal and 3 out of 4 North American MBRs selected that it would recover.

Participants were then asked how long they thought it would take for the BR to make a full recovery. Again, participants expressed optimism with 27 believing a full recovery would happen within 1-2 years and 11 believing it would take between 3-4. Only one participant believed that it would take 5-6 years.

Impact of Covid-19 on Tourism

Analysis indicated that almost all MBRs had seen a similar trajectory, with a loss in 2020, followed by a marked increase in the number of local and regional tourists visiting the park in Summer 2021, with 6 announcing that summer visitation has surpassed previous records. For many, this helped compensate for the loss of international tourists:

Limitations of international travel have benefited and increased local, regional and national tourism [Director, Sierra de las Nieves, Spain]

14 participants spoke about how one Covid-19 impact is the increase in opportunities for tourism development, as more tourists seek out nature-based holidays:

There was growth in this sector and there are even new companies emerging. It is evident that tourism in this territory is increasing, and it is related to the fact that tourists seek nature tourism [Territory Coordinator, Meseta-Iberica, Portugal/Spain]

However, MBRs which have tourist infrastructure for winter sports were heavily impacted by Covid-19 due to its resurgence and subsequent restrictions during winter. This may be attributable to their dependence on winter sports (see section 5.3).

Winter tourism has suffered much more strongly than summer/autumn tourism because of the stronger pandemic situation in winters. [Scientific Coordinator, Entlebuch, Austria]

With regards to businesses, two trends arose. Six MBRs stated that the gastronomy industry has been heavily impacted by closures and struggled to find enough skilled workers and that many have gone out of business as a result. However, 3 MBRs which are close to large cities stated that the increase in local tourists saved the restaurants:

Small-scale hospitality and some businesses/entrepreneurs were able to flourish thanks to the proximity tourism. [Employee, Ticino Val Grande Verbano, Italy]

Impact of Covid-19 on Communities

As seen earlier, 84% of all respondents indicated that their MBRs were dependent to extremely dependent on tourism. This indicates that MBR communities would be impacted by the fluctuations in tourism numbers.

- No Community Impact

Eleven stated that the pandemic has not impacted communities, whether that be culturally or financially, and that communities had adapted and got used to the new reality, suggesting resilience.

This is a mostly rural territory and in the villages little or nothing has changed in everyday life except the lack of tourists. [Territory Coordinator, Meseta Iberica, Portugal/Spain]

- **Positive Community Impact**

Ten stated that MBR communities had become stronger because of Covid-19, with the pandemic offering them the positive opportunity to focus back in on themselves and the nature that surrounds them.

Communities have shown resilience and built on existing support systems. Covid has provided opportunity for reflection and change in priorities and focus. [Business Development Officer, Galloway and Southern Ayrshire, UK]

- **Negative Community Impact**

On the other hand, 8 wrote that community tension increased due to either distrust of outsiders, who may be carriers of Covid-19, or frustration relating to tourism oversaturation, provoking tension between tourism stakeholders and locals not involved in tourism.

There is more anxiety about visitors here and less of a welcoming attitude overall. [General Manager, Wester Ross, UK]

Overtourism has created tensions with local stakeholders. [Director, Ordino, Andorra]

As well as increased tension, 3 spoke of the cultural impact of Covid-19, with local events being cancelled, reducing community cohesiveness. Three spoke specifically about the mental health impact that the pandemic has had on MBR communities:

there is a high level of stress, and many people/businesses are almost at the end of what they can manage from both an economic and a mental health point of view. [Executive Director, Waterton, Canada]

Understandably, 21 MBRs spoke of a loss of financial revenue for the communities, specifically at the beginning of the pandemic and during winter. Two Spanish MBRs spoke about the challenge of balancing the communities with ageing populations which are more susceptible to Covid-19, with their dependency on tourism for the economic wellbeing of their communities.

Finally, 4 respondents spoke about the lack of affordable housing since the start of the pandemic, with temporary home ownership increasing, reducing access for locals:

There were many sales of houses and holiday homes to temporary homeowners. For the local population, finding housing has become very difficult since Covid-19. [Manager, Engiadina Val Müstair, Switzerland]

5.3 Diversity

Questions based on tourism practices were created to not only understand what current tourism practices are in MBRs but also to assess diversity – whether the MBR in question is dependent on tourism, whether business within the MBR depends on tourism and whether MBR tourism is diverse, a key indicator of resilience, as seen in the literature review. This information shall allow global sustainable mountain tourism stakeholders to view similarities and differences within the EuroMAB network.

Dependency

Out of the 39 MBRs, 33 (84%) MBRs range from having their business dependent to extremely dependent on tourism, corresponding with global mountain economy trends (section 1.3). On the other hand, only one biosphere in Norway (Nordhordland) stated that

BR businesses are not dependent on tourism, while 5 stated that their businesses are not very dependent on tourism. The survey sample size is too small to discuss whether one specific sub-region is more dependent than another, but it is worth noting that all 14 Mediterranean sub-region MBRs stated that they were dependent, very dependent, or extremely dependent.

Activities

Participants were asked to provide what the main tourism activities in the area were, producing Figure 10. The results paint a homogenous picture of MBR tourism, with 38 out of 39 MBRs stating that they practice nature-based mountain tourism (respondents also termed this as eco-tourism and ecological tourism).

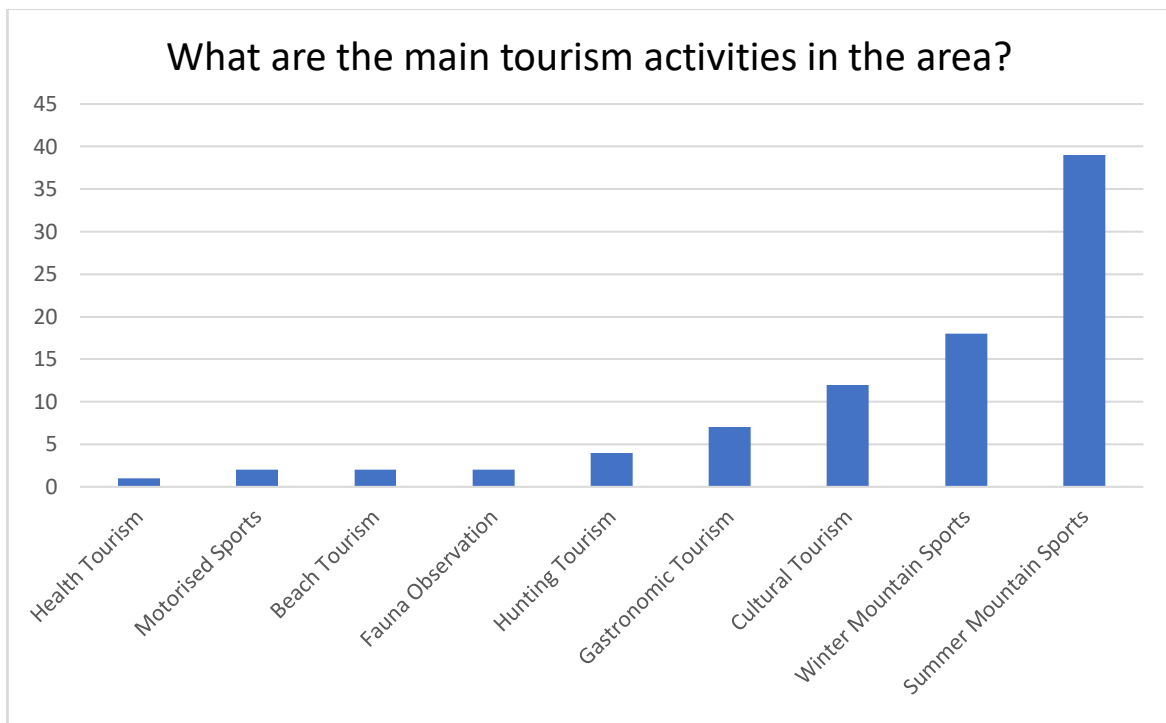


Figure 10: Main MBR tourism activities

All MBRs stated that their tourists practice summer mountain sports, with the principal type being hiking (39) and cycling (12). Other types of summer mountain sports include water sports, climbing and horse-riding. Eighteen MBRs mentioned winter mountain sports tourism, which is principally ski-based (12). Beyond summer and winter mountain sports,

12 mentioned cultural tourism, such as visiting museums and exhibitions. Seven mention gastronomical tourism (all in the Mediterranean subregion or France). Four spoke of hunting/fishing tourism (MBRs in Canada, USA and Norway), 2 mentioned fauna observation (both in Spain), 2 beach tourism (France and Greece), 2 motorised sports (Canada and Spain) and one mentioned health tourism (Germany).

This diversity in response, however, did not entail a diversity in tourism. Specifically, 64% (n=25) of the responses only fit into two of the categories. Of these 24, 19 of the responses were only mountain sports (summer and winter). Out of the 6 respondents in CSA and East Europe, 5 gave only one response (summer mountain sports), indicating formerly communist countries may be less diversified.

MBR Tourists

Understanding where MBR tourists come from is crucial to being able to analyse the impact of Covid-19. An example of this would be to analyse whether MBRs, which are dependent on international tourism, have been impacted more than others. Participants were therefore asked to rate 4 tourism categories (local, regional, national and international) according to importance, with the results mapped in Figure 10.

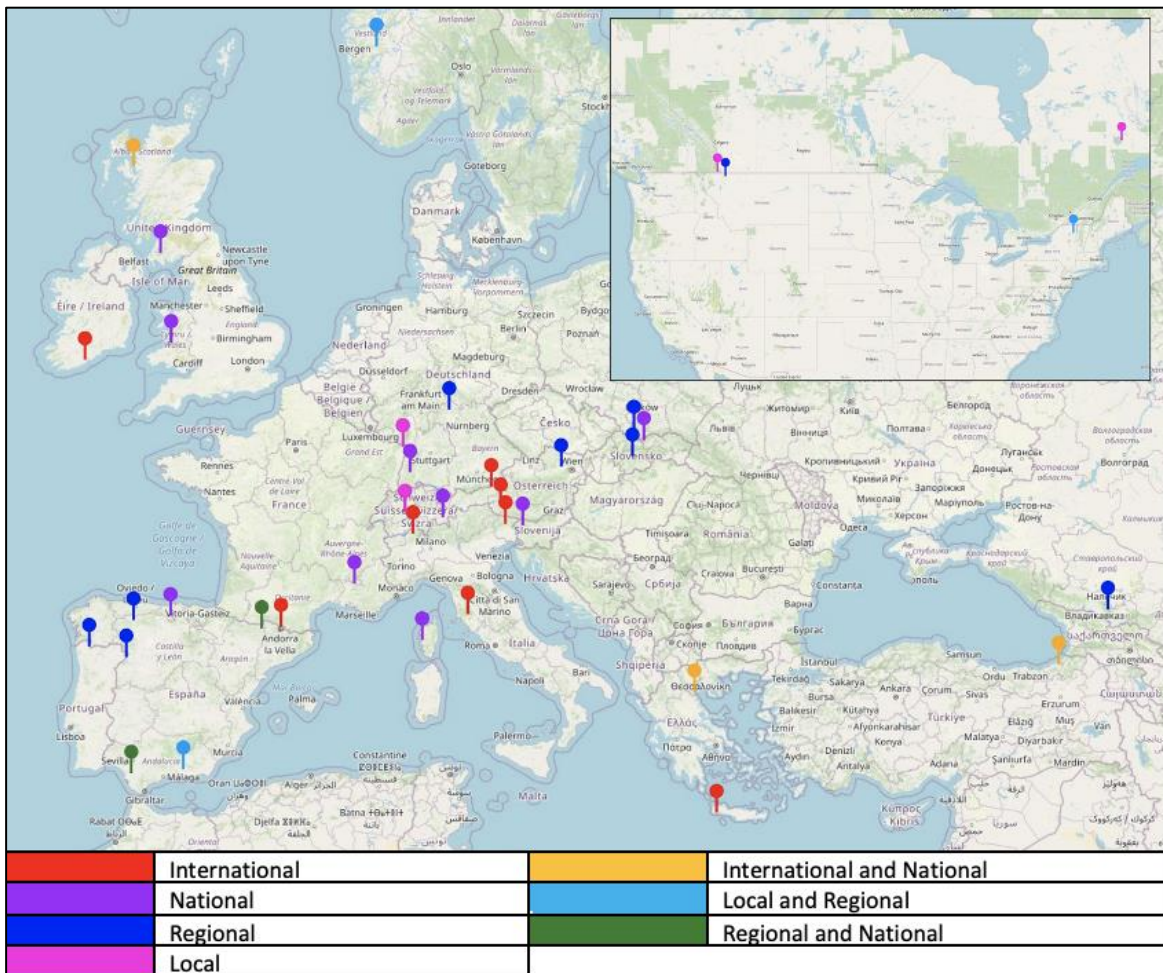


Figure 11: Map of MBR by top ranking tourist type. Katunskiy BR/Great Altai TBR is not present on the map and selected regional as most important tourist category

International Tourists

Eleven MBRs chose international tourists as the most important or joint most important contributor to the local economy. Of note is that these 11 came from two subregions: Mediterranean and western Europe. Ten out of 11 who selected international, selected national as of equal importance or the second most important. This suggests that those BRs who are dependent on international tourism are structured in such a way that attracts national tourists too, perhaps with more overnight options for those coming from far away. Eight are non-diverse (two or less types of ecotourism in the MBR- see Figure 10), with all 8 involved only in summer and winter mountain sports. Remarkably, out of the 8 MBRs who selected international as the only first choice, 6 were involved in ski tourism.

The combination of dependency on winter mountain sports and international tourists was discussed by several (4) MBRs over the course of the survey. This led to a discussion on the need to transform:

In mountain BRs the focus of tourism has historically been on winter, shifting the activities more strongly to summer is a way many mountain regions are seeking currently [Scientific Coordinator, Entlebuch, Austria]

Those MBRs which stated that they were strongly dependent on international tourists and are in peripheral locations, often at borders. Additionally, 3 out of 4 respondents who cited that they were overdependent on tourism selected international. This overdependence coincided with a dependence on mass-tourism, such as bus tours.

Much of our tourism infrastructure is based around the model of large international visitors and coach tours. This model was not able to adapt during Covid and simply shut down. [Biosphere Officer, Kerry]

National Tourists

Thirteen MBRs selected national as the most important to the local economy. All were within 2 subregions: Mediterranean and western Europe, with the sole exception of the Tatra transboundary biosphere (Poland/Slovakia). Out of the 13, 4 stated that international tourism was of equal importance, and 3, regional. These MBRs are less winter-tourism oriented (5) and tend to have more diversity in activities, with many engaged in cultural (7) and gastronomical tourism (5).

Regarding the pandemic, several MBRs expressed that tourism had been saved by national tourists, demonstrating the importance of being known nationally. This is not related to country size as it seems there was enough demand for nature-based activities in all countries, big and small.

Summers have been saved thanks to French tourists [Ecotourism Manager, Mont-Ventoux, France]

Regional Tourists

Sixteen MBRs selected regional as the most important contributor to the local economy. Contrary to the Western Europe/Mediterranean dominance of the previous two categories, representation in this category is spread across the EuroMAB network. All 4 Russian and American MBR respondents are in this category. This fact makes sense, given the scale of Russia and the USA and the fact that many BRs have large populations living nearby. Of the 16 MBRs, 5 responded with local as of equal importance to the MBR economy, 4 responded with local tourism as the second most important, and 5 chose national as the second most important. All 5 were on the Iberian Peninsula (Spain and Portugal).

Three respondents which chose regional visitation wrote that the lack of surrounding populations helped them avoid the impact of overtourism, showing the importance of where the MBR is situated.

We were lucky not to get overcrowded like other alpine regions during the pandemic. Maybe due to missing big cities around [us] Manager, Großes Walsertal, Austria]

Local Tourists

Ten MBRs chose local as the most important contributor to the local economy. The MBRs were from across the network. To note is that both Canadian MBRs (Waterton and Manicouagan-Uapishka) and Nordhorland (Norway) selected local tourists as the most important category. Out of the 8 MBRs which selected local, 8/ 10 are either far from major cities, or on an international border/ transboundary All MBRs which selected local tourists as the most important to the local economy either selected regional in joint 1st place or

chose it as the second. 50% chose international as the least important. Seven out of 10 were undiversified (only summer and winter mountain sports on offer).

5.4 Resilience

Finding out how respondents felt that stakeholders within the MBRs are dealing with the pandemic is an important means to understand the impact of Covid-19 on EuroMAB MBRs. Participants were asked directly about it in 3 questions but wrote unprompted about resilience throughout the survey, indicating knowledge of resilience.

Participant opinions on BR tourism in relation to resilience indicators

The first of the three questions focused on resilience aimed to deepen understanding of resilience and assess which specific parts of resilience participants believe their BRs contained. This was done through using resilience indicators produced in section 4.5.

Globally, the results (Figure 11) showed that the majority of respondents affirmed positively (strongly agreed/agreed) to the statements, with an overall mean of 66% of respondents either agreeing or strongly agreeing.

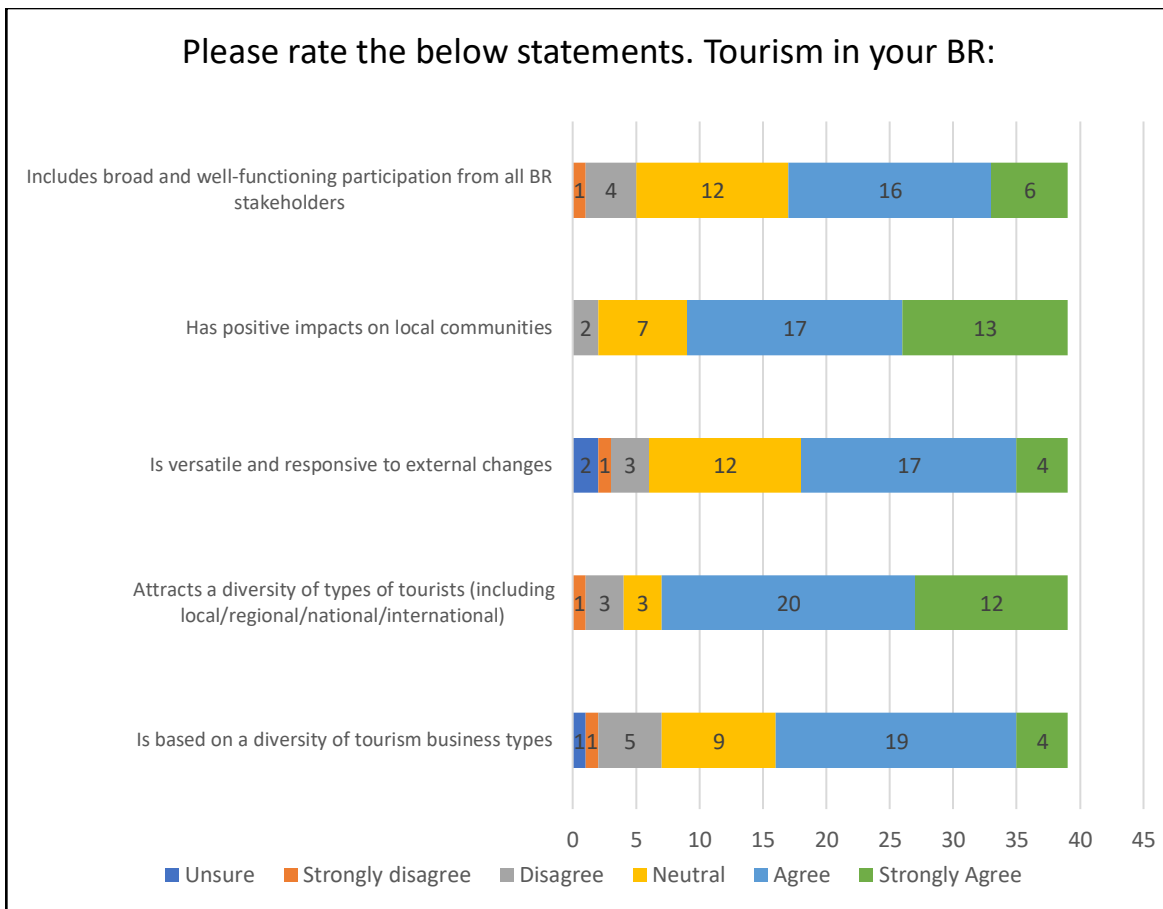


Figure 12: Participant responses regarding resilience indicators

Table 9 summarises the positive response rate to resilience indicators. The results demonstrate that MBRs overall agree that their MBR tourism attracts a diversity of tourists and has a positive impact on local communities. On the other hand, they are less convinced that MBR tourism is based on a diversity of tourism business types, includes broad stakeholder participation or is versatile and responsive to external changes.

Tourism in my MBR:	Positive Response %
Attracts a diversity of types of tourists	82
Has positive impacts on local communities	77
Is based on a diversity of tourism business types	57
Includes broad and well-functioning participation from all BR stakeholders	56
Is versatile and responsive to external changes	54

Table 9: Summary of survey resilience results

Overall Resilience

Participants were asked to define their MBR's overall resilience, referring to the thesis definition of resilience: *the ability to cope, adapt and transform when faced with threats*.

As the majority of the MBRs believe that they are still recovering or actively reacting to the situation, one might anticipate that respondents might be pessimistic regarding MBR resilience. Yet, results demonstrate optimism, with 75% of respondents believing their BR to be either *resilient* (n=22) or *very resilient* (n=7). 15% (n=6) chose *neither resilient or unresilient*, 10% (n=4) chose *unresilient* and none chose *very unresilient*.

Participants were also asked to explain their choice regarding MBR resilience, leading to interesting responses from which several themes arose, many of which linked with research resilience indicators.

Those who responded *Very Resilient* or *Resilient* had similar explanations:

- **Flexibility of small-scale tourism stakeholders**

30% (n=12) stated that the fact that their tourism is flexible with most companies being family-owned and small-scaled which often have multiple sources of income (not just dependent on tourism)

It is a tourism that is not overcrowded, with a very flexible structure, which results in facilitating adaptability and the capacity for transformation. [Director, Valles de Omaña y Luna, Spain]

Most small companies are not depending on a single source of income but have additional mainstays. So, they can shift priorities if necessity arises [Project Manager, Wienerwald, Austria]

- **Importance of Sustainable Tourism Principles**

25% of respondents (n=10) wrote about how following sustainable principles and focusing on small-scale ecotourism has helped them adapt to the Covid-19 pandemic:

Companies in our area are helped by their small size, as they have always had an approach compatible with the principles of sustainability. [Employee, Ticino Val Grande Verbano, Italy]

Due to the focus on small scaled and sustainable tourism offers [...], we recognised good tourism activities as soon as travelling was allowed again. [Manager, Großes Walsertal, Austria]

- **Importance of cohesive communities**

18% (n=7) stated the importance of having strong-rooted and cohesive communities which enable BR tourism to be resilient.

The community itself is historically a resilient community, with a great capacity to deal with, renew and adapt to changes. [Territory Coordinator, Meseta Iberica, Portugal]

Following on from this, several spoke about how the fact that businesses within the BRs are small, family-run businesses which combine the attributes mentioned above (following sustainable principles, flexible, community-led and diverse).

- **Importance of diversity**

13% (n=5) explained their response through having a diversity of tourist offerings meaning that their tourism was more resilient to the Covid-19 pandemic.

Our region is strongly dependent on tourism, but it is also very diverse (summer and winter activities) and suitable for many groups of guests. [Vice-Director, Nockberge, Austria]

Conversely, 70% of all respondents (n=10) who responded that their tourism was unresilient or neither resilient nor unresilient, stated specifically that it was due to a lack of diversity in their tourist offering:

Because the tourism is not diverse. There is the absence of infrastructure for different types of tourism such as healing or skiing. [Deputy Director, Katunskiy/Altai TBR, Russia/Kazakhstan)

Stakeholder Resilience

Participants were also asked how they felt stakeholders in their BRs were dealing with the pandemic, overall. The involvement of stakeholders is key for resilience, meaning it was thus important to ascertain how the participants believed their sustainable tourism stakeholders were doing. Responses were positive, with 66% (n=26) believing that stakeholders are either doing well or very well. Additionally, 30% (n=12) chose the neutral response (neither well nor badly). Only 1 respondent felt that stakeholders were dealing badly with the pandemic and 0 chose very badly.

When analysing the results through sub-regions, 2 trends appeared:

1. Out of the 4 BRs that chose *Very Well*, 3 of them were from central and southeastern Europe (75% of total respondents from that sub-region).
2. 100% (n=4) of North American participating MBRs indicated that their BRs were doing badly, or neither well nor badly. This may be more a reflection of North American attitudes towards the pandemic. In fact, the one MBR that selected the response *Badly* wrote:

The majority of people in the local area do not take the pandemic seriously. [...] Only a small percentage (anecdotally <10%) follow mask mandate guidelines [Director, Crown of the Continent, USA]

5.5 Sustainable Development

As discussed in the literature review, sustainable development whether that be sustainable tourism or other is strongly linked with resilience theory, with Marchese et al. (2018) stating that sustainability is part of resilience. Therefore, if a business follows sustainable development principles it will be more resilient.

Results in Figure 13 are interesting as they were not as conclusive as one would think given all respondents are highly involved in sustainable development in their MBRs. While 70% agreed or strongly agreed with the statement, 30% were neutral, indicating doubt as to whether sustainable development principles do make tourism businesses more resilient to external threats. On the other hand, it is noteworthy that no MBR disagreed with the statement.

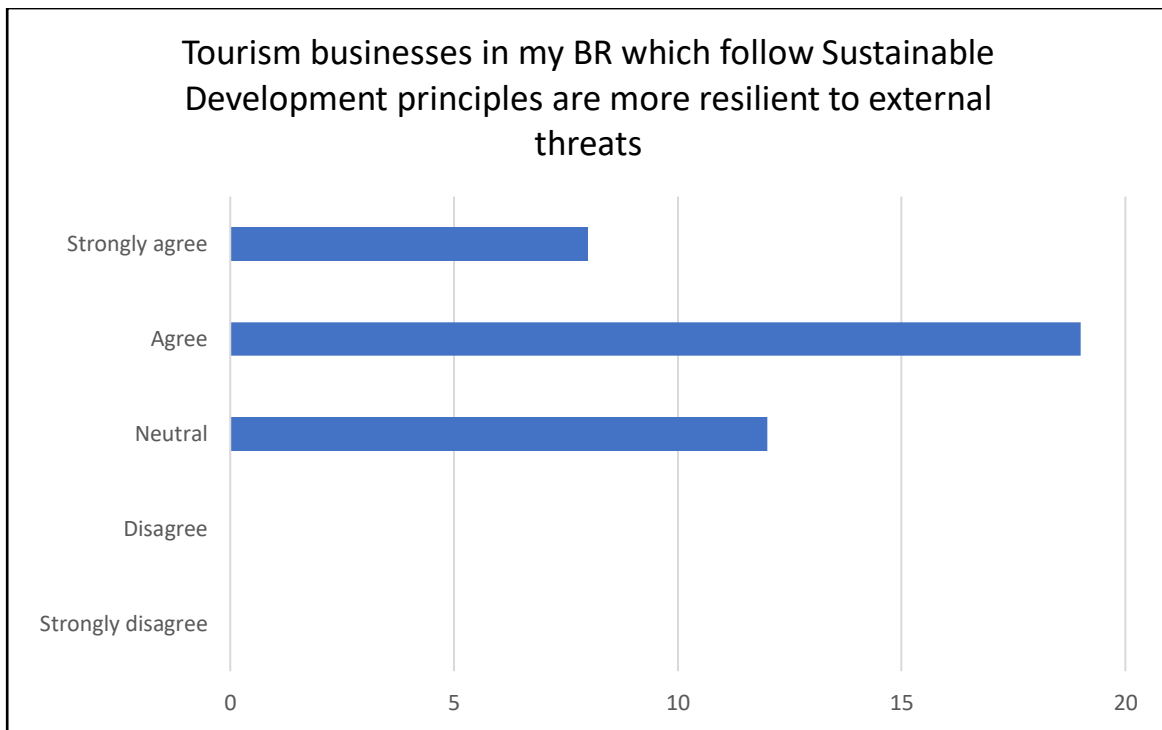


Figure 13: Respondent belief on relationship between sustainable development principles and resilience

Several themes arose, with a lot of commonalities in response from across the network.

- **Perceived strong link between SD and resilience**

Five mentioned that there is (in their opinion) a direct link between following sustainable development principles and resilience stating that businesses which embrace sustainability tend to have more resilience:

Following sustainable principles builds resilience by conserving resources and being mindful of alternative practices. [Director, Crown of the Continent, USA]

Additionally, 5 other MBRs stated that following sustainable principles “future-proofs” businesses, as in doing so one must take a more long-term perspective. Preparing for the future by working together in networks and preparing for difficult years thus increases resilience:

Sustainable tourism businesses work and think about their work in a different way. They look in the future and they work together in a network of sustainable partners. [Head, Rhön, Germany]

Following this, 3 spoke of how following sustainable principles makes tourist business more attractive to clients, which in turn makes the enterprises authentic. This authenticity makes the businesses unique and builds customer loyalty, helping them stay afloat during times of crisis:

Guests come back many times because they like this [...] authenticity due to strong connection to natural issues of the region. [Manager, Großes Walsertal, Austria]

Two spoke specifically on how tourism businesses with MBRs that follow sustainable development principles tend to increase the diversity of their product, which as a result leads to them becoming more resilient to external threats:

The development of a sustainable tourism approach accompanies the diversification of activities and the networking of actors. It also favours the lengthening of the tourist season and proximity tourism [Ecotourism Director, Mont Ventoux, France]

This led many to conclude (both within this question and throughout the survey) that Covid-19 could in fact be an opportunity for ST in MBRs and elsewhere:

Covid is a chance for sustainable tourism not only in BRs, but especially in BRs (Head, Rhön, Germany]

- **Uncertainty over resilience to external threats**

Six MBRs stated that it was not clear to them whether within the current pandemic context whether tourism companies which follow sustainable development principles did any better than their non-sustainable counterparts. These six stated that there is too are too many internal differences between ST companies to be able to state that there is a link between sustainable development and resilience. Furthermore, it depends on the external threat:

I would say that this depends strongly on the type and severity of the threat. An overall statement would be generalising too much. [Scientific Coordinator, Entlebuch, Switzerland]

Moreover, 2 respondents within the 'unsure' theme specifically stated the lack of information on which businesses followed sustainable development principles making them unsure of what to respond.

[It is] hard to find examples of businesses in my BR which follow Sustainable Development principles. [Head, Tatra, Poland]

- **Importance of other factors**

The second sub-theme is that of other factors. One factor cited by several MBRs, for example, was how the geographic location of the biosphere affected how Covid-19 affected their BR and resilience – with the respondent for Appenino Tosca Emiglia BR (Italy) stating that all businesses have suffered in the pandemic due to a lack of national publicity. Four BRs mentioned that there are many other factors which are of as much importance as SD regarding a tourism businesses' resilience, hence why they selected neither agree or disagree:

There are many factors that influence the resistance of companies to the crisis. From indebtedness to the type of company, or also its sustainability. [Manager, Ordesa Viñamala, Spain]

5.6 Covid-19 Innovation

Innovation is key for resilience, providing the tools for transformation. This survey thus aimed to assess whether the EuroMAB network had innovated during the Covid-19 pandemic so as to review the association of innovation with resilience and what the MAB network can offer other Sustainable Tourism operators and networks.

Note that what is innovative is to some extent subjective within this context. 87% (n=34) responded to this section. Responses were filtered to remove any measures that were government-imposed or based on new standard hygiene procedures globally. This led to 21 responses, which were grouped into the following themes:

Support: Nine MBRs spoke about how they increased support for businesses and stakeholders within the park. Two mentioned specifically how they helped BR businesses sell their products directly to consumers, providing technical help to help set up e-commerce. The participant from Großes Walsertal in Austria described how they helped local farmers set up vending machines on their sites to sell their products. Both

participating Scottish BRs mentioned the creation of a grant scheme for tourism innovation to help support Covid recovery and one other spoke about financially supporting the eco-renovation of lodging within the park.

Digital communication: Seven MBRs replied stating that the pandemic had led to the increased digitalisation in their BRs, whether that be promotion, networking with shareholders over zoom or communication.

Promotion: Six MBRs detailed that they had increased promotion during the pandemic, with the aim of refocusing their tourism offer to appeal more to local/regional tourists. Waterton BR (Canada) discussed the promotion of staycations and Picos de Europa (Spain) spoke about the creation of new trails for forest bathing (Shinrin-yoku).

Control: Four MBRs spoke about how they had increased visitor management/guidance to control capacity. For example, the hiring of more rangers, and increasing visitor guidance to ensure that visitors use the MBR in a sustainable way.

Planning: Finally, two MBRs spoke about how they had worked on creating plans such as destination plans to move forward out of the pandemic. Destination management plans incorporate all the above categories and bring together stakeholders.

Participants were then asked to rate the success of the innovation they provided. Results below in Figure 14 demonstrate that overall MBRs deem the measures implemented to counter the impacts of Covid-19 have been effective.

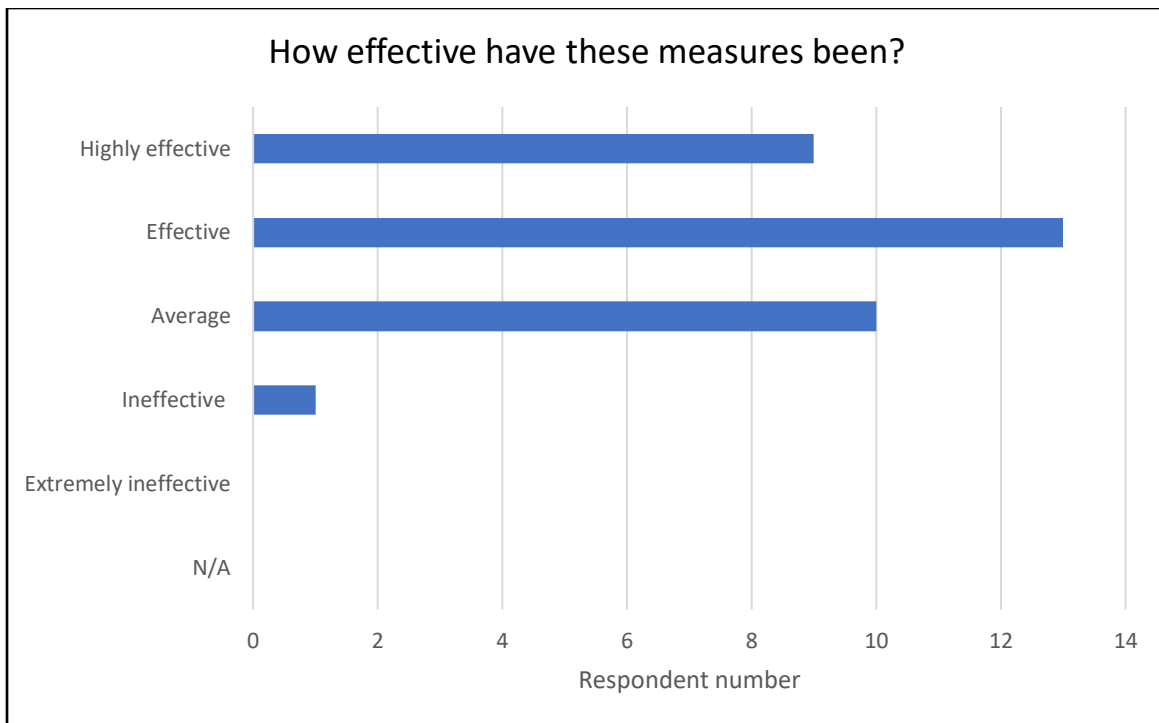


Figure 14: Participant rating of measure efficiency

Participants were also asked whether they thought that the measures could be implemented elsewhere with success. The majority of MBRs (n=17) who responded to this question believed that the measures could be implemented elsewhere with success. Nine replied maybe to the question and 3 replied no. This indicates that there is potential for learnings from the EuroMAB network to be shared more broadly both internally within the global MAB network, and also within the sustainable tourism industry.

5.7 Support

Participants were asked to rank the type of support that they receive from the MAB network (Figure 15).

Results were surprisingly non-uniform, with results indicating that MBRs do not necessarily receive the same level of assistance across the EuroMAB network. Indeed, 5 attributed an N/A to each type of support, demonstrating that there is a disparity in support in the network.

Analysis shows that research and knowledge sharing amongst BRs is the most important, which is reinforced by those who provided innovation measures in section 5.6 with 62% stating that at least one of their measures had been shared with the network. Moreover, when respondents were asked to explain why they put research and knowledge sharing in first place, 8 gave similar answers to the quote below:

We realised how other BRs were dealing, which gave us tools to deal with Covid-19 and adapt our activity. The spirit of union and camaraderie between BRs [...] gave us the capacity for resilience. [Coordinator, Meseta Ibérica, Portugal/Spain]

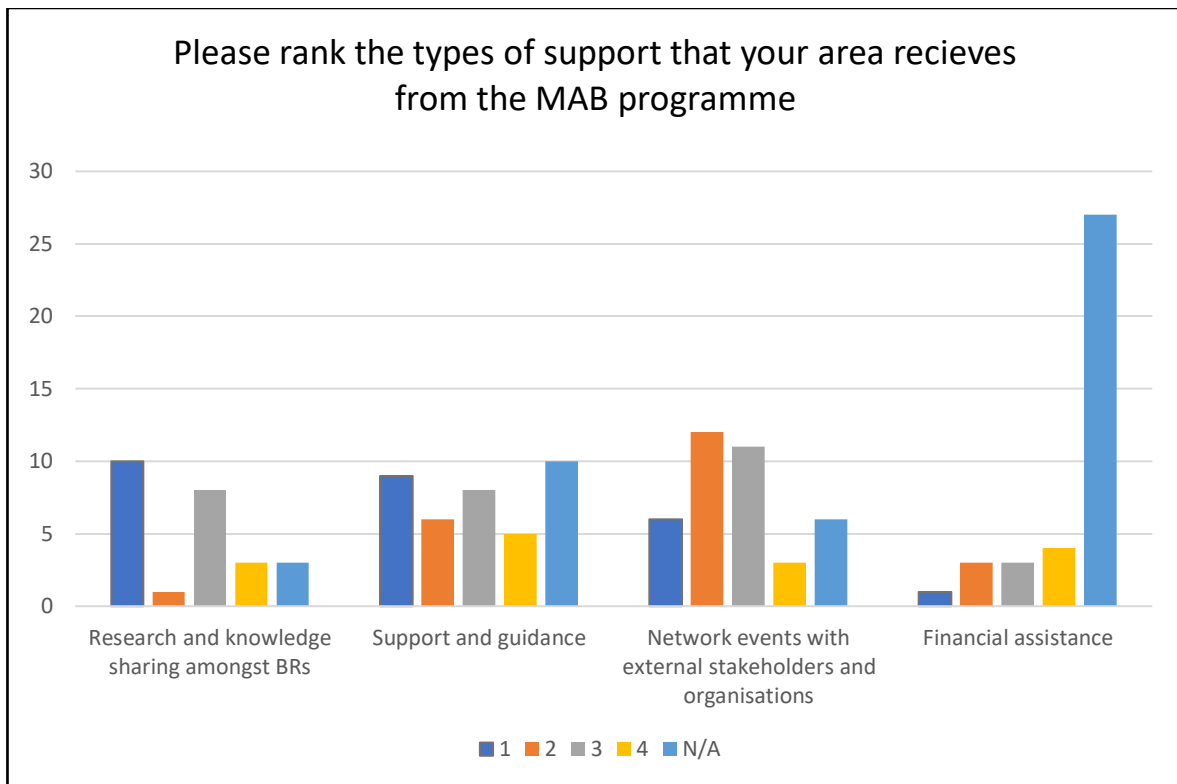


Figure 15: Support MBRs receive from MAB. 1=most important, 4= least

The least important type is financial support. In fact, 69% of respondents (n=29) put N/A as a response, indicating that they received no MAB financial support during the pandemic, and only one put it in first place.

Participants were also asked to rate how helpful they found the MAB network during the pandemic. Results demonstrated that most BRs considered the BR network of limited help

to MBR tourism during the pandemic, with 11 stating that belonging to the BR network was not at all helpful, 7 slightly helpful and 16 choosing somewhat helpful. Surprisingly, only 5 stated that belonging to the BR network was very helpful (4) or extremely helpful (1).

While it is impossible due to the sample size to draw national conclusions about the data, several national trends arose regarding the helpfulness of the BR during the pandemic. Spanish MBRs all stated that they had received help during the pandemic, with responses verging from somewhat helpful to very helpful. On the other side, all MBRs in France, Canada, USA and Poland all responded with slightly helpful or not at all helpful.

This raises questions about the importance of the national BR network input in comparison to the international.

Organisation Support

Beyond this, participants were asked to rank BR network support (MAB Secretariat and national MAB Committees) in comparison to other organisations (national, regional and local government, community organisations and NGOs).

Results as shown in Figure 16 demonstrate overall that MBRs stated that they received more support from all government levels and community organisations than either the MAB secretariat or the National MAB committee, with respondents overwhelmingly ranked the two MAB options in 6th and 7th place.

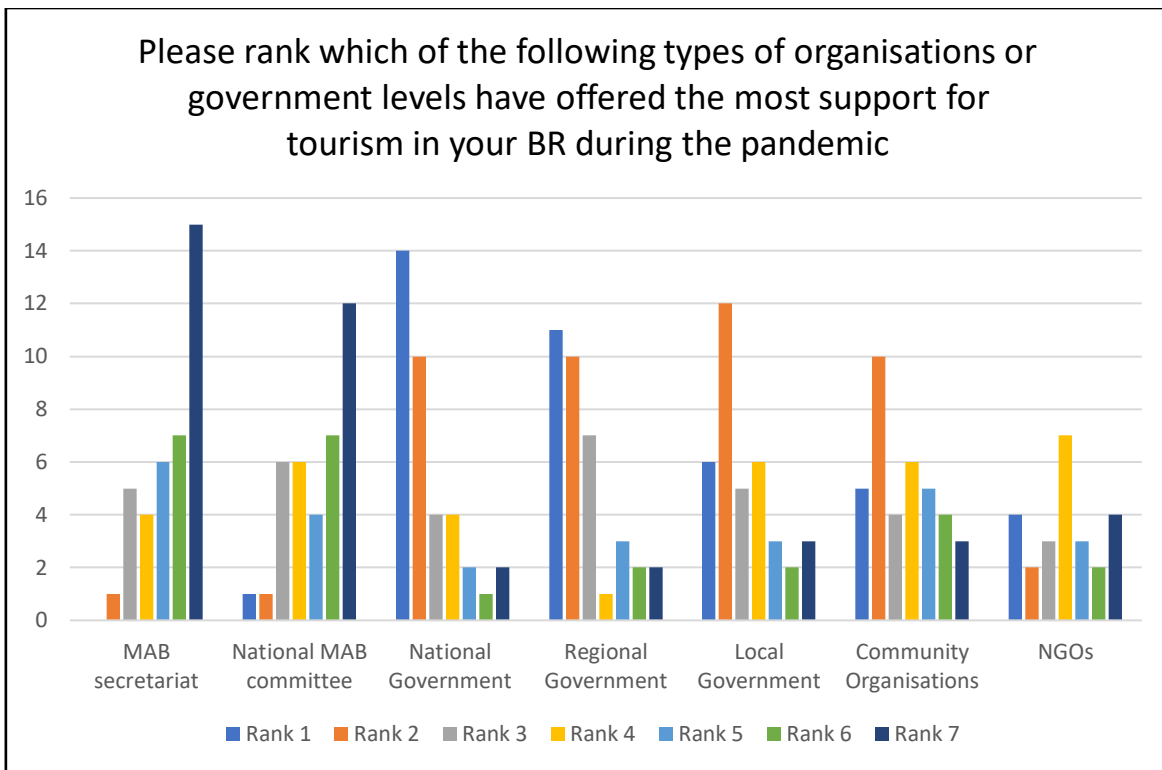


Figure 16: Ranked support by main support organisations. Rank 1 = most important, Rank 7 = least important

Data indicates that overall respondents ranked support from the national MAB committee higher than the MAB secretariat. Certain country trends are present, with MBRs in Spain Italy and Greece giving the two MAB networks higher rankings whereas Canada, the UK, Poland and USA all gave lower rankings:

No MAB assistance or action was provided during the pandemic. [Director, Manicouagan-Uapishka, Canada]

On the other hand, government levels dominated ranks 1-3, demonstrating the importance of their support during the pandemic. This was supported by MBRs stating the importance of government for financial support, something that MBRs qualified as unimportant or non-existent in Figure 15. This is backed qualitatively, with many BRs stressing the importance of government for funding:

Government has provided enough financial support that most stakeholders are doing OK, [...] without this, resilience would have been far less. [Director, Waterton, Canada]

Overall, MBRs ranked regional government as providing the most support, followed by national, with local of least importance. MBRs in Poland and Spain all allocated the lowest scores to each of the government types.

Community organisations and NGOs tended to be well spread throughout the rankings. This scattering could be attributed to the diversity of both types, as they vary enormously regarding the role, aim and type throughout Europe and North America. No country/sub-region trends were identified.

Finally, Several MBRs (n=4) mentioned that other networks were as important to them for getting through Covid-19, as most MBRs are also part of additional park networks which often overlap with MBR boundaries:

Note that we are part of the PNR too (Federation of National Parks – France), and both (PNR and MAB) are useful [Director, Vosges-du-Nord/Pfälzerwald, France/Germany]

6.0 Discussion

If there was one word which came out of this thesis regarding the impact of Covid-19 it would be *optimism*. Optimism is demonstrated throughout the survey results, with findings showing MBRs have dealt remarkably well with the impact of Covid-19. Furthermore, MBRs are optimistic about the future of MBR tourism and perceive opportunities for the growth of nature-based sustainable mountain tourism.

This optimism is shown in the data, with all respondents believing that tourism would recover, with 50% believing it would change, and 50% believing it would go back to normal. Moreover, 38 out of 39 participants stated their BR would be fully recovered within 3-4 years. This thesis anticipated more pessimism, giving survey question response options of up to 10+ years. Findings counter this author's assumption that the negative impact of Covid-19 would entail a pessimism towards the future, particularly as 69% (n=27) of MBRs stated that they were still either recovering or actively reacting to the situation.

This optimism is in stark comparison with the catastrophic impact described on global tourism. Compared with literature review findings, this thesis research compares favourably with literature descriptions of the impact of Covid-19 and aligns with the study on resilience within the Italian UNESCO network (UNESCO 2021). Results from MBR participants are more homogenous than those of the literature review, with the impact of Covid-19 being similar across MBRs surveyed. 87% (n=33) have had issues relating to overtourism, with many of these first experiencing undertourism, with a loss of tourists in 2020, and a gain in 2021 which often surpassed pre-pandemic visitation. One can assume that these similarities are due to being in a similar, Global North context, with similar trends in increased visitation being described by McGinley et al. (2020).

Resilience

Exploring MBR resilience in sustainable tourism and Covid-19 was one of the key objectives of this dissertation, allowing for a more nuanced discussion on the impact of Covid-19.

Overall, MBRs have demonstrated resilience throughout the survey. 70% (n=27) stated their MBR tourism was resilient or very resilient, with no participants stating that their MBR was not resilient. What was more interesting, however, was how they rated themselves according to resilience indicators, with an overall positive response rate of 66%. It is striking, (Figure 15, p.53) however, that the two lowest marks are based on structural resilience, which is more based on the administration of the BR. 74% of all respondents (n=29) are directly involved in MBR management. This demonstrates that MBR perceptions of low resilience can be resolved through a change in MBR policies, such as increasing BR stakeholder participation through meetings and communal projects.

Diversity

There are key MBR traits which determine the perceived impact of Covid-19: diversity, with those with more tourist and activity diversity, and smaller-scale family-run diverse companies being more 'nimble' and more likely to have benefitted positively overall from the pandemic. Conversely, MBRs which contain non-diverse tourism, whether that be for tourist or activity type, have been more heavily impacted by Covid-19 than those which have tourism which is more diverse. For example, those who depend on a particular type of tourist (such as international) or those dependent on a particular type of tourism activity (such as ski tourism), were demonstrably more negatively impacted by Covid-19. This is similar to literature review findings where those who diversified (Abdallah and Kataya, 2021, Karagiannis and Metaxas 2020) did better during the pandemic than those who did not (Shresta and Decosta 2021, King et al. 2021).

Additionally, those with tourism based on large-scale tourism operators, such as Kerry BR in Ireland, which is dependent on bus tours for international tourists, have been more heavily impacted than those which have small-scale, family-run companies, which have the flexibility and community support to transform rapidly. This evidence certainly supports the work of King et al. (2021) and Abdullah and Kataya (2021) who describe how small-scale, flexible community-led enterprises have shown more resilience during the pandemic.

This demonstrates the importance of having a diversity of tourist types to increase redundancy, and the danger of over-dependence on international tourism, a theme seen in multiple case-studies within the literature review (Galas et al. 2021. Cherkaoui et al. 2020, Shresta and Decosta 2021). Moreover, out of the 11 survey participants who stated that international tourists were the most, or joint most, economic contributor to the local economy, 9 stated that their MBR tourism would be different post-pandemic, writing in the survey about the need to diversify away from international tourists, to having a more resilient, sustainable tourism based on local/regional/national tourists. This shows that the MBRs are already aware of the dangers of dependency on a particular type of tourism/tourist, with Altai TBR in Russia, for example, stating that MBR tourism is unresilient because it is not diverse.

Communities

The results varied significantly between MBRs, with some participants stating the positive impacts and some the negative. Some communities struggled with a lack of housing, heightened by the increase in second-home buying and tourism during the pandemic. Mediterranean sub-region MBRs such as Valles Y Omaña BR were less able to make the most of opportunities in tourism, due to having to protect communities with ageing demographics. Some communities rose to the challenge and embraced tourists whereas some looked inwards and became distrustful of outsiders. Results are unclear regarding which factor determined community attitudes towards tourism. One key trend is that many communities (e.g Galloway and South Ayrshire BR in Scotland, Rhön BR in Germany) used the tourist slowdown during the pandemic as an opportunity for introspection and positive regeneration, as indicated by Scheyvens et al. (2021).

Sustainable Development

Another thesis objective was to understand how resilience is related to sustainable development principles. Overall, findings suggest that participants agree with sustainable development principles helping increase resilience, encouraging collaboration and thinking

of the future, and attracting a diversity of tourists. For example, 70% of respondents stated that MBR tourism stakeholders who apply SD principles are more resilient. This corresponds with Marchese et al. 2018, who state that sustainable development is a component of resilience.

On the other hand, 25% of respondents wrote about how the relationship between sustainable development and resilience is contextual, depending on the size of the event, and other influencing factors. If a company follows sustainable development principles, but is not in a network, or diverse, the fact it follows SD principles is not enough to withstand disruptive events. This finding fits well into the thematic hierarchy produced from the literature review (section 4.6), where there are multiple themes/contributors to resilience which together provide strong general resilience.

Innovation

Innovation is seen as a key factor to resilience, with the MAB network known globally as an innovation laboratory. Results show that many MBRs innovated digitally during the pandemic, supporting tourism businesses with e-commerce (Méseta-Iberica BR), creating more online streams and events (Polana BR), providing support for local entrepreneurs to create new businesses (Wester Ross BR), helping existing businesses diversify through tourism promotion campaigns (Kerry BR), and assisting local businesses with direct sales (Mont-Ventoux BR). This diverse innovation undoubtedly has helped MBRs and their tourism stakeholders transform and become more resilient to the impact of Covid-19, helping keep ST businesses vibrant and healthy throughout the pandemic.

Support

Research from this thesis demonstrates the importance of the EuroMAB network as a key means to share knowledge, information, and innovation, supporting MBR overall resilience. This is demonstrated by the fact that 62% of ST innovations mentioned above were shared within the network.

However, results also demonstrate that MBRs experienced different levels of support, with this being determined by the MAB national committee. For example, all Spanish MBRs stated that they had received high levels of support, whereas other countries received none, such as Canada and Poland. The difference in pandemic experience between North American and European MBRs is also striking.

Additionally, results demonstrate that the EuroMAB or similar networks cannot be a substitute for support from governments as the two fulfil different functions roles with government providing financial support to tourism stakeholders whereas data shows that the EuroMAB does not. This contradicts literature review findings in which publications in the Global South (Cherkaoui et al. 2020, Gabriel-Campos et al. 2021, Shresta and Decosta 2021) spoke for the need of additional networks, to help fill vacuums of government support.

Implications for global tourism

This study helps address the current literature gap on the impact of Covid-19 on ST resilience, providing an indication that the application of sustainable tourism by EuroMAB MBRs has demonstrated resilience against the impact of Covid-19. Considering this, tourism policymakers should consider scaling-up the MAB ST model and ensure that networks similar to EuroMAB are created to support stakeholders.

MBRs which reported having maximized on opportunities are those which have a tourism based on a diverse local tourism, whereas those more focused on international travel and ski tourism have been heavily impacted. It is interesting to note that both factors have also been proven to relate to lower ST resilience in relation to climate change. International tourism predominantly relies on the heavy consumption of fossil fuels, through long-distance travel in cars and aeroplanes (Gössling 2015). Ski tourism is dependent on snow, which is decreasing as the planet warms, negatively impacting climate change resilience and increasing vulnerability in communities dependent on it (Elsasser and Messerli 2001, Scott et al. 2020). This suggests, in concurrence with the discussion in section 1.3 of

Carpenter et al. (2012), that by focusing on increasing SES resilience against one type of disaster, such as Covid-19, one increases overall general resilience, helping combat the pernicious effects of climate change.

The thesis also indicates how resilience is multi-factorial, supporting the literature review conclusion, with authors of several case studies highlighting what they were missing in order for their sustainable tourism to be resilient: diversity (Cherkaoui et al. 2020, Broker-Bulling 2020, Shresta and Decosta, 2021, Kastenholz et al 2022), network support (Gabriel-Campos et al 2021), government support (Tlali and Musi 2022) and community support (King et al. 2021). In concurrence with the literature review, results demonstrate that it is not enough to follow sustainable development principles to be resilient, but one must also focus on diversity, support and innovation. Much like how sustainable development is equally based on the three pillars of development (economic, social and environmental), this research suggests that resilience is based of four pillars, as highlighted in figure 17 below:

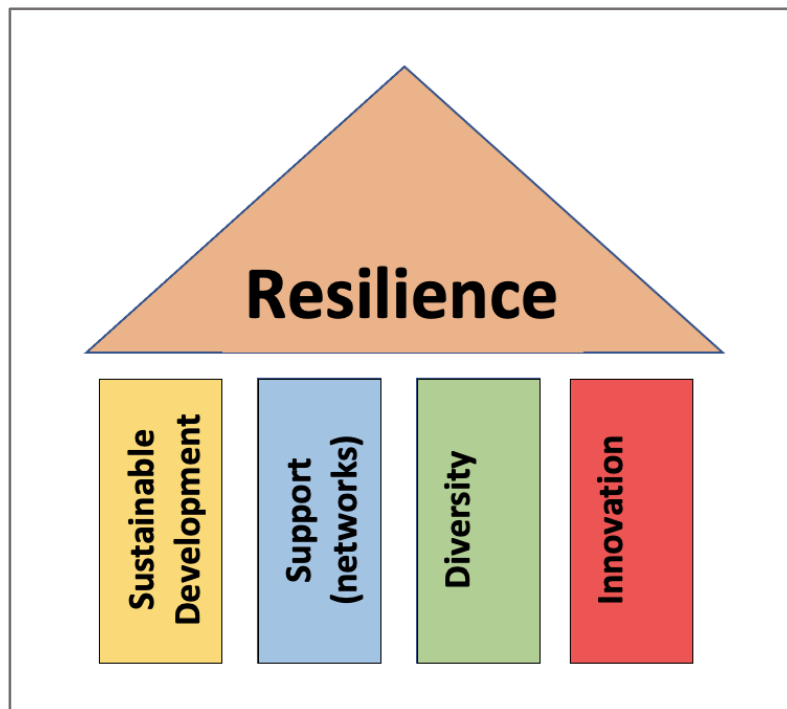


Figure 17: Thesis conceptualisation of the 4 pillars of resilience

As discussed in section 1.4, mountain SES are disproportionately by both Covid-19 and climate change. Post-pandemic tourism is trending towards nature-based meaningful experiences, which plays to sustainable mountain tourism strengths. Supporting this trend, this thesis highlights the importance of sustainable tourism to increase SES general mountain resilience. A move to a sustainable, innovative and diversified mountain tourism which is supported by communities, networks and government, is therefore paramount to help 21st century mountain communities across the planet thrive and be resilient to global warming and climate change.

6.3 Recommendations

Two key recommendations arise to help the EuroMAB MBR network become more resilient:

1. Establish a EuroMAB sustainable tourism committee which would promote and support moves to a more diverse tourism, through promoting national and regional tourism and helping diversify BR tourism businesses.
2. Address stated shortcomings in resilience through increasing participation from all MBR ST stakeholders. This would be done by holding network meetings to discuss methods to increase business diversity and preparedness for future extreme events such as Covid-19.

6.4 Further research

This survey-based research produced many thought-provoking questions for further research to deepen the study on the impact of Covid-19 on sustainable tourism.

Conducting qualitative interviews with MBR is the logical next step as part of an exploratory mixed methods approach. The interviews would build on and add depth to the research findings. Key interests would be:

- Explore the relation between community and resilience – how do community characteristics and dynamics facilitate MBR resilience?
- Focus on the future of ST, by asking MBR participants who thought that their tourism would recover but be different, how it would be different and what do they see arising?

Furthermore, it would be interesting to conduct comparative research within other MAB networks and review the impact of Covid-19 on sustainable tourism, However, results would differ due to temporal differences, as the impact of Covid-19 is constantly changing.

6.5 Study Reflections

This study was ambitious, exploring the impact of Covid-19 on sustainable tourism, assessing the resilience of MBRs, investigating the importance of the MAB network, and evaluating the relationship between resilience and sustainability.

A survey format was, I believe, appropriate, because of the large geographical scale sought to cover. Integrating interviews to produce mixed methods-based research might have improved results through providing additional insight, but this was beyond the scope of this MSc dissertation.

Lastly, it is important to remember that this study was limited in size and time. Results provide insights but are not conclusive as do not necessarily reflect the experiences of the wider tourism community within the MBRs. Tourism stakeholders were not included and may have had contrasting views on the impact of Covid-19. Moreover, each MBR was only represented by one participant, thus not necessarily reflecting the views of the management team. There is also the potential for positive bias, as participants work for the MBRs, meaning that may be more likely to say positively report on how their MBRs recovered from Covid-19.

7. Conclusion

This study provides an important contribution to Sustainable Tourism studies, giving an empirical study on the impact of Covid-19 on Sustainable Tourism in Mountainous Biosphere Reserves in the EuroMAB UNESCO network.

In order to assess this impact, 39 MBR management staff from 19 countries within the network were sent a 22-question survey, exploring the impact of Covid-19, resilience and its relationship to sustainable development, and the role of the EuroMAB network in supporting MBR tourism stakeholders and encouraging sustainable tourism innovation.

The literature review of the impact of Covid-19 on tourism suggests factors for resilience – innovation, diversity, support (community, networks and government) and following sustainable development principles. This thesis research aligns with the literature, showing how MBR ST demonstrates resilience in the face of global extreme events such as Covid-19 through combining these factors.

Findings in this research reveal biosphere tourism has not only proven to be remarkably resilient with those who have a more diverse and local tourism faring particularly well. MBRs have also transformed and optimised on the surge in demand for nature-based tourism during a period of unprecedented disruption in the global tourism industry. Finally, participants are optimistic about the future of ST in their MBRs.

Considering the current literature gap on the impacts of Covid-19 on sustainable tourism, these results are of interest to stakeholders in mountain tourism. Specifically, this study provides empirical evidence that a move to a sustainable, innovative and diversified mountain tourism, such as that of EuroMAB MBRs, can enhance general resilience to external threats such as Covid-19 and climate change.

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Appendix 1: Survey Participants

Country	MBR	Participant Title
Andorra	Ordino	Director Research and Innovation / Scientific Committee of the BR
Austria	Großes Walsertal	Manager
	Nockberge	Vice director, Project management
	Wienerwald	Project manager
Canada	Manicouagan-Uapishka	<i>Conseiller, recherche et territoire</i> (Research and territory advisor)
	Waterton	Executive Director
France	Falasorma - Dui Sevi	<i>Coordinateur de la Réserve de biosphère</i> (BR Coordinator)
	Mont-Ventoux	<i>Chargée de mission Ecotourisme</i> (Ecotourism Director)
France/Germany	Vosges du Nord - Pfälzerwald	<i>Chargé de mission Observatoire du territoire - Système d'information - Référent MAB</i> (Director – country observer, information system, MAB representative)
Germany	Rhön	Head of the administration (Hesse)
	Schwarzwald	<i>Referent für Regionalentwicklung</i> (Regional Development Representative)
Greece	Mount Olympus	Guide
	The Gorge of Samaria	Environmental Engineer, working at the Management Body of Samaria National Park- West Crete
Ireland	Kerry	Biosphere Officer
Italy	Appennino Tosco Emiliano	Employee
	Alpi Juliani	Nature Conservation Associate -the Department of Sustainable Development
	Ticino Val Grande Verbano	Responsible: promotion and conservation of nature
Norway	Nordhordland	Coordinator / project leader
Poland	Babia Góra	Director
Poland/Slovakia	Tatra	Head of research department

Portugal/Spain	Gerês-Xurés	Managing director (of ADERE-Peneda Gerês)
	Meseta Ibérica	Portuguese territory Coordinator
Russia	Khakassky	Assistant Director for Scientific Work
Russia/Kazakhstan	Great Altay (Katunskiy)	Deputy Director For Science
Slovakia	Polana	Manager of Biosphere Reserves of Slovak Republic
Slovenia	Julian Alps	Head of Information and Education Service
Spain	Ordesa Viñamala	Manager
	Picos de Europa	<i>Directivo Técnico</i> (Technical Director)
	Sierra de las Nieves	<i>Coordinador. Responsable de Gestión</i> (Management coordinator)
	Sierra Nevada	Director
	Valles de Omaña y Luna	<i>Gestora de la Reserva</i> (Reserve Manager)
Switzerland	Engiadina Val Müstair	management BR
	Entlebuch	Scientific Coordinator
Turkey	Camili	Manager
UK	Dyfi	Chairperson of the Biosphere Tourism Association
	Galloway and Southern Ayrshire	Business Development Officer
	Wester Ross	General Manager
USA	Champlain-Adirondack	Co-chair
	Crown of the Continent	Director, Crown of the Continent Research Learning Center

Appendix 2: Overview of Literature Review

Study characteristics		n	Reference
Study design	Qualitative	9	Gabriel-Campos et al. (2021), Kastenholz et al. (2022), Shresta and Decosta (2021), Galas et al. (2022), Broker-Bulling (2020), Tlali and Musi (2022), King et al. (2021), Cherkaoui et al. (2020),
	Quantitative	2	Castanho et al. (2020), Abdallah and Kataya (2021)
	Mixed methods	3	Karagiannis and Metaxas (2020), Scheyvens et al. (2021), McGinlay et al. (2020), UNESCO (2021)
	Literature Review	1	Fernández-Bedoya et al (2021)
Name of tourism in article	Sustainable Tourism	9	Castanho et al. (2020), Abdallah and Kataya (2021), Shresta and Decosta (2021), Galas et al. (2022), Broker-Bulling (2020), Scheyvens et al. (2021), Karagiannis and Metaxas (2020), McGinlay et al. (2020), UNESCO (2021)
	Ecotourism	5	Gabriel-Campos et al. (2021), Cherkaoui et al. (2020), Tlali and Musi (2022), Fernández-Bedoya et al (2021), (King et al. 2021),
	Rural tourism	1	Kastenholz et al. (2022)
Geographical region	Europe	5	Kastenholz et al. (2022), Castanho et al. (2020), Karagiannis and Metaxas (2020), McGinlay et al. (2020), UNESCO (2021)
	North America	1	Broker-Bulling (2020)
	South America	2	Gabriel-Campos et al. (2021), Galas et al. (2022)
	Asia	2	Shresta and Decosta (2021), King et al. (2021)
	Middle East	1	Abdallah and Kataya (2021)
	Africa	2	Cherkaoui et al. (2020), Tlali and Musi (2022)
	Oceania	1	Scheyvens et al. (2021)
	Global	1	Fernández-Bedoya et al (2021)
UNESCO based	Yes	3	Abdallah and Kataya (2021), Galas et al. (2021), UNESCO (2021)
Mountain Based	Yes	8	Castanho et al. (2020), Galas et al. (2022), Tlali and Musi (2022), Broker-Bulling (2020), Shresta and Decosta (2021), Abdallah and Kataya (2021), Gabriel-Campos et al. (2021), Cherkaoui et al. (2020)
Themes relating to resilience theory	Innovation	7	Kastenholz et al. (2022) Castanho et al. (2020), Abdallah and Kataya (2021), Karagiannis and Metaxas (2020), Tlali and Musi (2022), Scheyvens et al. (2021), UNESCO (2021)
	Community	6	Gabriel-Campos et al. (2021), Shresta and Decosta (2021), Broker-Bulling (2020), Tlali and Musi (2022), King et al. (2021), Scheyvens et al. (2021)
	Networks	6	Gabriel-Campos et al. (2021), Kastenholz et al. (2022), Karagiannis and Metaxas (2020), Galas et al. (2022), Scheyvens et al. (2021)
	Sustainable Development	5	UNESCO (2021) Abdallah and Kataya (2021), King et al. (2021) Kastenholz et al. (2022), Gabriel-Campos et al. (2021), Tlali and Musi (2022),
	Diversity	4	Castanho et al. (2020), Abdallah and Kataya (2021), Cherkaoui et al. (2020), Tlali and Musi (2022)
	Government	4	Shresta and Decosta (2021) Karagiannis and Metaxas (2020), Broker-Bulling (2020), Cherkaoui et al (2020)

Appendix 3: Survey Invitation

15/02/21

The Centre for Mountain Studies
Crieff Road
Perth
PH1 2NX
UK

MSc dissertation request

To whom this may concern:

My final year dissertation focuses on the impact of Covid-19 on sustainable tourism programs in Mountain Biosphere Reserves and will assess resilience and explore innovative responses to the aforementioned impact. Sustainable tourism is a key economic motor for many Mountain Biosphere Reserves, helping towards the achievement of the UN SDGs. Current literature indicates that across the world many sustainable tourism projects are struggling for want of support and knowledge on how to best respond to the impact of Covid-19 on their sustainable tourism programs. I hope that this study of MBRs will help in this regard.

Data collection for this research project will involve a survey for individuals who work in BRs in mountain settings and are directly implicated in BR sustainable tourism programs. If you believe you fulfil this criterion, I would be like to invite you to take part in a short survey.

Please click here to fill out the survey: <https://uhi.onlinesurveys.ac.uk/covid-19-impact-on-tourism-in-mountainous-brs-2>

If you do not feel that you fulfil the criterion, I would be very grateful if you could refer me to the relevant person at your BR.

I look forward to hearing from you. And if you have any questions, please do not hesitate to contact me on 18016822@uhi.ac.uk or by phone +1 438 763 6071 (standard and WhatsApp).

Thank you,

Will Hotopf

Appendix 4: Survey Questionnaire

Page 1: Introduction

Welcome to the survey which aims to assess the impact of Covid-19 on Tourism in Mountainous BRs. The survey is comprised of 24 questions and should take 15 minutes to fill out.

Before starting, I would like to thank you for your participation!

1. Which Biosphere Reserve (BR) are you currently involved with?

2. What is your job title?

Page 2: Tourism

Please provide me with information concerning tourism in your BR.

3. For how many years has tourism taken place in your BR?

- 1-10
- 11-20
- 21-30
- 31-40
- 41-50
- > 50 years

4. What are the main tourism activities in the area?

5. To what extent are businesses in your BR dependent on tourism?

- Extremely dependant
- Very dependent
- Dependent
- Not really dependent Not
- dependent

6. Where do your tourists come from? Please rank the following in order of importance to the local economy. (1 = most important, 4= least important)

	1	2	3	4
Local	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
International	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. Since the pandemic, has your BR experienced the following?

- Not enough tourists (undertourism)
- Too many tourists (overtourism) both
- undertourism and overtourism Don't
- know

Page 3: Impact of Covid-19

The impact of Covid-19 on worldwide tourism is unprecedented. Within many mountainous regions reliant on tourism, the result has often been catastrophic. What has been your experience?

8. At what stage of response is the organisation which runs your BR in terms of responding to the Covid-19 pandemic? You may tick multiple boxes if you believe that different parts of your BR are at different “stages”

- Actively responding to the current situation Recovering
- Back to business-as-usual Other
-
-

8.a If you selected Other, please specify:

9. How do you feel stakeholders in your BR are dealing with the pandemic **overall**?

- Very well
- Well
- Neither well or badly
- Badly
- Very badly

9.a Please explain your answer on how your BR is doing overall (the next two questions are more focused on tourism and communities)

10. What has been the impact of Covid-19 on communities within your BR?

11. What has been the impact of Covid-19 on tourism within your BR?

12. How do you believe tourism in your BR will recover from the impact of Covid-19?

- A) Tourism will go back to normal
- B) Tourism will recover, but be different
- C) Tourism will not recover

12.a If you answered with a) or b), how many years do you foresee it taking for your BR tourism to make a full recovery?

- 1-2
- 3-4
- 5-6
- 7-8
- 9-10
- > 10 years

Page 4: Resilience

Resilience theory indicates that communities following sustainable development principles should be more resilient and should thus recover faster from global catastrophe events. Here I would like to assess BR resilience as an indicator of the relationship between sustainability and resilience.

13. This survey defines resilience as **the ability to cope, adapt and transform** when faced with threats. Referring to the above definition of resilience, how resilient overall would you define tourism in your BR to be on the scale below.

- Very resilient
- Resilient
- Neither resilient nor unresilient
- Unresilient
- Very unresilient

13.a Please briefly write your reason for the response you just gave to question 13, referring to the definition of resilience as the ability to cope, adapt and transform

14. Please rate the below statements. Tourism in your BR:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Unsure
Is based on a diversity of tourism business types	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Attracts a diversity of types of tourists (including local/regional/national/international)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is versatile and responsive to external changes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has positive impacts on local communities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Includes broad and well-functioning participation from all BR stakeholders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Tourism businesses in my BR which follow Sustainable Development principles are more resilient to external threats.

- Strongly
- Agree
- Neither agree nor disagree
- Disagree
- Strongly disagree

15.a Please explain your response to this question - what made you select your response?

Page 5: MAB Network

Background reading suggests that sustainable tourism stakeholders who belong to network(s) have better weathered the impacts of Covid-19. Here I would like to assess the BR network.

16. Please rank the types of support that your area receives from the international MAB programme (both global and national) in order of importance. Please select n/a if you have not received one of the supports listed below

	1	2	3	4	n/a
Support and guidance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Financial assistance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research and knowledge sharing amongst BRs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Network events with external stakeholders and organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16.a Have you received other support not mentioned above? Please mention it here.

17. How helpful has belonging to the BR network been to **tourism** in your BR during the pandemic?

- Extremely helpful
- Very helpful
- Somewhat helpful
- Slightly helpful Not
- at all helpful

17.a Please briefly explain your choice.

18. Please rank in order 1-7 which of the following types of organisations or levels of government that have offered the most support for tourism in your BR during the pandemic (1 = the most help, = the least)

	1	2	3	4	5	6	7
MAB Secretariat (including field offices)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National MAB Committee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
National government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regional government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Community organisations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NGOs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

.a Are there any types of organisation not listed that have provided assistance?

Page 6: Covid-19 Innovation

Background reading suggests many stakeholders in sustainable tourism projects globally are in need of new innovative approaches to combat the impacts of Covid-19. I hope the BR network can help.

19. What (if any) measures have been taken in your BR to respond to Covid-19? Please list up to 3 key measures.

--

20. How effective have these measures been? Please attribute a grade to each of the above responses from the below scale.

	Measure 1	Measure 2	Measure 3
Highly effective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Effective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Average	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ineffective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Extremely ineffective	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. Do you believe any of the measures you identified have the potential for wider implementation both in other BRs and in the wider sustainable tourism industry?

	Measure 1	Measure 2	Measure 3
Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maybe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21.a If you selected yes for any of the three measures, why do you believe it has potential for wider implementation?

22. Have these measures been shared among the MAB networks?

	Measure 1	Measure 2	Measure 3
Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
No	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unsure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
N/A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22.a If you wrote yes, how have these measures been shared?

Page 7: Next Steps

23. Please use this final box to add additional comments related to the survey and the impact of Covid-19 on tourism in your biosphere that have not already been mentioned.

24. After analysing the collected survey data, I will conduct interviews with willing participants over the telephone or online. Would you be interested in participating in an interview? If yes, please provide your email address below.

Page 8: Thank You

Thank you for filling out this survey, your participation is invaluable and much appreciated. The results of the survey will be shared with participants in May, and I hope to present the results at the EuroMAB conference in September.

