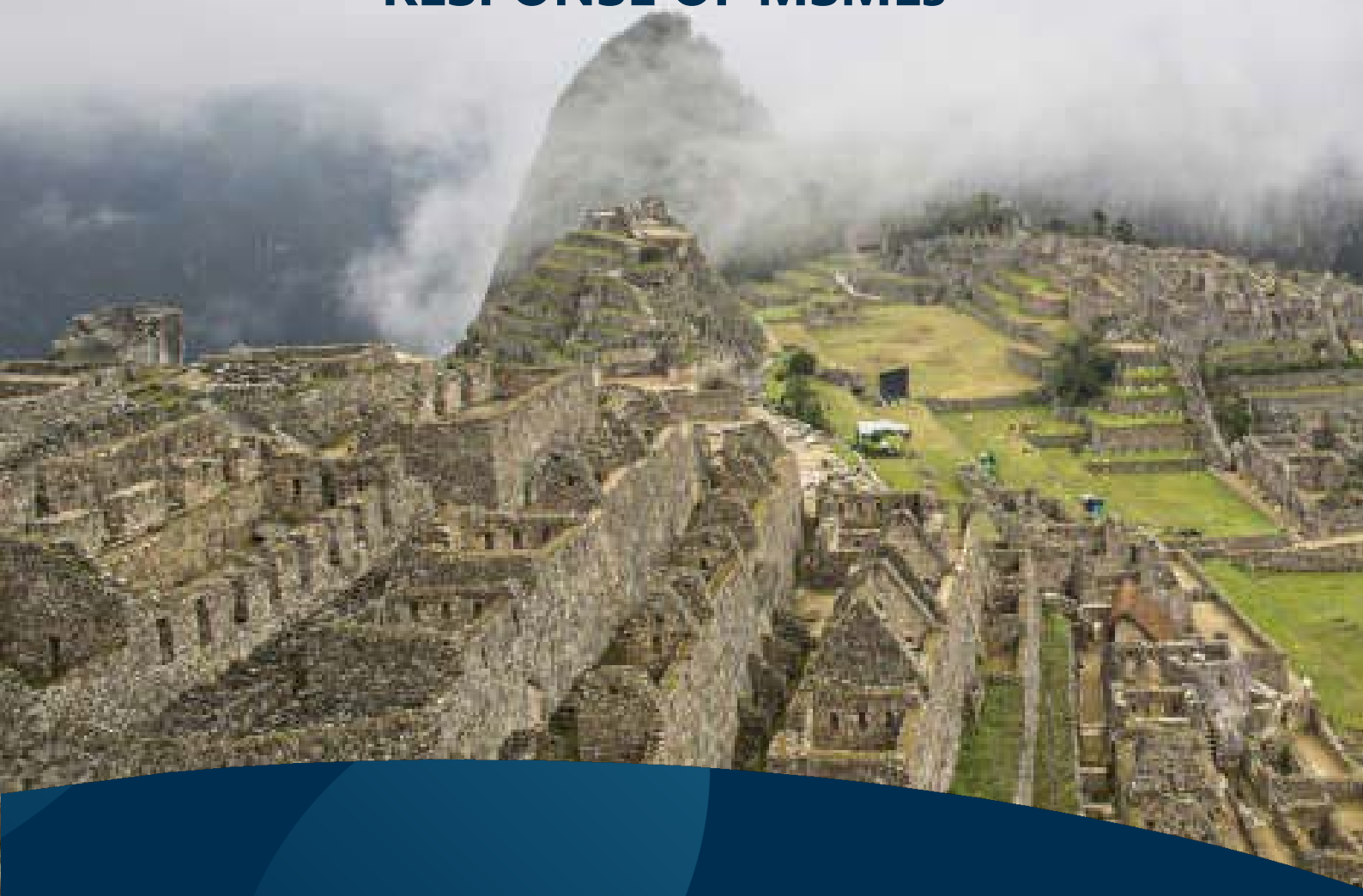
Asia-Pacific
Economic Cooperation

UNDERSTANDING THE ROLE PLAYED BY ICT IN DISASTER RESPONSE OF MSMEs



Study on the Assessment of the Level of Vulnerability of Tourism to Regional and Global Crises Focused on Micro, Small and Medium-Sized Tourism Enterprises (MSMEs): Opportunity for Risk Management Through Information and Communication Technologies (ICTs)

APEC Tourism Working Group
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Executive Summary

This report explores the vulnerabilities of tourism operators (micro, small and medium enterprises (MSMEs)) across APEC economies and the use of Information Communication Technology (ICT) to support disaster prevention, preparedness, response, and recovery. The report offers three phases of analysis, preliminary research and global best practice review, primary research of MSMEs in APEC economies and lessons learnt and recommendation.

The global tourism sector is dynamic and managing change and understanding risk to build resilience has become an essential part of business management. The sector is vulnerable to both internal and external risk. Vulnerability is defined as the propensity, sensitivity, or susceptibility to be harmed or adversely affected whilst lacking the capacity to cope or adapt. Tourism's reliance on a complex network of interconnected stakeholders and dependence on other industries often challenges its sustainability and viability and increases its vulnerability.

Phase one of the research explores the role of the major international bodies and agencies in supporting crisis and disaster preparedness, prevention, response, and recovery. Furthermore, the practical tools that have been developed to support economies, policy development and businesses in responding to the increasing challenges we are facing.

Phase one then deep dives into the APEC economies, the strategies, plans and research that has been conducted in each of the member states regarding broad disaster resilience and response and where viable, the tourism sector's response, including the use of ICT within processes.

Phase two utilizes primary research to understand member economy vulnerability and use of ICT in disaster resilience. This research was conducted through an online survey distributed across APEC economy members. A total of 250 usable surveys were attained across seven member states. Descriptive and inferential statistics were used to analyze the sample and understand the vulnerability of MSMEs to disaster and how they embed ICT in disaster preparedness, prevention, response, and recovery efforts.

Comparisons of business structure, business size and trading history were conducted to explore whether these factors influence operators' engagement with disaster management practices.

Findings demonstrate that there is a broad sweeping awareness of risk across businesses in the way in which natural, health, cyber, financial, and political related disaster events may influence or impact a business. However, there is less confidence across the sample in how smaller scale disasters or crisis events may impact day-to-day business operations – for example how slips, trips and falls, localized power outages or flooding of laundry facilities may damage business. The awareness of large disaster events enables operators to reduce vulnerability by targeting actions to prepare and mitigate against these risks. The lower

levels of confidence in small scale incidents indicate substantial vulnerabilities that need to be addressed.

Whilst there is an awareness of risks and disaster events, there is evidence that tourism businesses lack established and rigorous processes and policies to address the threats. Overall, a lack of preparedness was evident across the sample. More than one third of MSMEs do not have plans in place to support disaster response efforts, further highlighting the vulnerability of this cohort.

The primary research conducted identifies the barriers to preparedness that heighten levels of vulnerability include a lack of knowledge, finances, time, and limited network. some operators (more so those from Australia) do not identify a need to prepare for a disaster situation or do not perceive that they are in an area that is impacted by disaster situations.

When it comes to engaging with ICT as part of their disaster preparedness, response and recovery, the research demonstrates that MSMEs are constrained by a lack of awareness in terms of available technologies, the solutions that can be provided, a lack of skills among staff to implement the solutions in addition to their costs, and a lack of access to the technology.

The tourism industry is vulnerable to disaster events. Natural and man-made disaster events are recognized by the industry as significant challenges.

Despite a confidence in understanding how they will impact the business, there is still a lack of preparedness, especially among small businesses and businesses that have been operating for less than four years. According to Forbes, only about 50% of businesses make it through the first five years, hence giving them the best chance of success through building resilience will help reduce vulnerability.

The final phase of the report identifies lessons learnt and explores opportunities to engage ICT in the tourism sector's disaster preparedness. The report acknowledges that barriers to preparedness are aligned with previous research findings: a lack of knowledge, resources and time prevent business engagement in reducing vulnerabilities and building capacity to adapt. Understanding these challenges is a key to reducing vulnerability, enhancing capacity and building resilience. Knowing that time and finances are also barriers, providing a cost effective, on-demand model is important so that tourism business owners, managers and team members can access anytime, anywhere at a reasonable price-point. Training should first raise awareness of core risks relevant to the destination, which will then be built on prevention, preparedness, response and recovery strategies and frameworks. Such strategies and frameworks will then be implemented and tested to assist operators in setting the structures they need in place. ICT therefore offers a cost effective and broad reaching approach to delivery. ICT should also be familiar to encourage engagement.

Similarly, a lack of knowledge is seen as a key barrier to implementation of ICT in crisis response: firstly, knowledge of solutions, and secondly, skills within the team. Building skills

and capacity across both these areas is also important to strengthen the approach to. Simple solutions are required so that skills and knowledge are built over time, and the complexity of the technology implemented can be enhanced accordingly. MSMEs that participated within this study were confident with the use of social media, websites, and mobile applications. These would be ideal solutions to support further engagement with disaster preparedness. More complex solutions are used in other sectors and as such, a collaborative approach could be applied to support learnings.

The way disaster risk, resilience, and vulnerabilities are thought across MSMEs needs to be shifted. It is clear from the findings of this research that the same approach to management is not building capacity. Taking a systems-based approach and reducing network vulnerability may support a nuanced approach to the tourism system that builds community capacity in a different and more effective way.

This report highlights that there is still vulnerability across the tourism sector in APEC economies despite an increasing number of disaster events. Policy intervention and support is required to assist businesses to better prepare, respond and recover from disasters.

Contents

Acronym List

In alphabetical order:

AI	Artificial Intelligence
APEC	Asia-Pacific Economic Cooperation
AR	Augmented Reality
CDEM	Civil Defense Emergency Management [New Zealand]
COVID-19	Coronavirus Disease
CRIS	Caribbean Risk Information System
DMO	Destination Management Organizations
ERM	Enterprise Risk Management
EU	European Union
GDP	Gross Domestic Product
GEJE	Great East Japan Earthquake
GFC	Global Financial Crisis
GFDRR	Global Facility for Disaster Reduction and Recovery
GIDRM	Global Initiative on Disaster Risk Management
GIS	Geographic Information System
HR	Human Resources
IBM	International Business Machines Corporation
ICT	Information and Communication Technologies
IDB	Inter-American Development Bank
IPCC	Intergovernmental Panel on Climate Change
MIS	Management Information Systems
MSMEs	Micro, Small And Medium Businesses
NEMA	National Emergency Management Agency [The Bahamas]
NTO	National Tourism Organizations
OECD	Organization for Economic Co-operation and Development
PATA	Pacific Asia Travel Association
PNG	Papua New Guinea
QRA	Queensland Reconstruction Authority
RTO	Regional Tourism Organization
SaaS	Software As A Service Solutions
SARS	Severe Acute Respiratory Syndrome
SDG	United Nations Sustainable Development Goals
SIDs	Small Island Developing States
SMS	Short Message Service
STERG	Scottish Tourism Emergency Response Group
UK	United Kingdom
UNDRR	United Nations Office for Disaster Risk Reduction
UNISDR	United Nations International Strategy for Disaster Reduction
UNWTO	United Nations World Tourism Organization
VR	Virtual Reality

WEF	World Economic Forum
WTTC	World Travel and Tourism Council

Project Overview

Project Description

It is recognized that tourism is susceptible to various internal and external factors, since it is a complex network that is interconnected to other sectors of the economy. Given the interconnected nature of the network, economic growth and benefits at a social level can be inconsistent. Despite this, with proper management and the coordination with other sectors the tourism sector can be positioned as a catalyst to achieve economic and social development for economies. Tourism, when effectively managed, can bring benefits to the host population and visitors, without excluding them due to their physical, economic, or other conditions.

As the tourism industry continues to feel the impact of COVID-19 and the uneven recovery, the United Nations World Tourism Organization (UNWTO) maintains that international tourism contracted by 65% in the first half of 2020. This equates to a loss of 440 million international arrivals and approximately US $460 billion in export earnings from international tourism. This unprecedented drop in the history of tourism put millions of jobs and countless businesses at risk. Yet, COVID-19 is not the only risk the industry faces, with changing climate impacts, natural disasters are more severe and more frequent than ever, the tourism industry is more vulnerable than ever.

Now is the time to consider the vulnerability of tourism on a global scale and rethink the systems and structures that support this critical sector of the economy. There is an opportunity to examine and transform aspects of business risk management appropriate to micro, small and medium enterprises (MSMEs) to reduce vulnerabilities, build resilience and to strengthen the visitor economy for a sustainable future.

This project has three clear objectives:

1. Evaluate studies and cases analyzed on risk management and the use of Information and Communication Technologies (ICT), with the participation of all APEC member economies, exchanging relevant information to optimize decision-making to improve the tourism sector.
2. Identify the main risks that tourism operators and MSMES face in various scenarios.
3. Propose a tool through risk management processes, considering the importance and use of ICT, which allow better decisions to be made in uncertain environments towards a resilient economy.

A partnership was developed between EarthCheck and the University of Queensland to deliver these outcomes based on a methodology that offers three phases:

1. Preliminary research examining global best practice drawing on a minimum of three (3) case-studies highlighting risk management and the use of ICT.

2. Evaluation of the level of vulnerability of tourism among APEC economies engaging industry and stakeholders through a questionnaire.
3. Delivery of an evaluation report, risk management strategies, risk management tools, recommendations and lessons learnt to build resilience among MSMEs through ICT.

This report presents the findings from all three phases of secondary (preliminary), primary research, and associated recommendations.

PHASE 1 – INTERNATIONAL SCAN

Phase 1 – Introduction

It is recognized that tourism is susceptive to various internal and external risks since it is a complex network that is interconnected to other sectors of the economy. This can make economic growth and benefits at a social level inconsistent. Despite this, with proper management and effective links and ties to other sectors of the economy, the tourism sector can act as a catalyst to achieve economic and social development of economies. It can facilitate inclusion of host populations and visitors, without exclusion to physical, social, or economic conditions.

The United Nations adopted the *Sendai Framework* in 2015 at the third UN World Conference on Disaster Risk Reduction. The framework overviews seven clear targets and four priorities for actions to prevent new and existing disaster risk:

i. Understanding disaster risk;
ii. Strengthening disaster risk governance to manage disaster risk;
iii. Investing in disaster reduction for resilience; and
iv. Enhancing disaster preparedness for effective response.

The framework also articulates the need for increased understanding of disaster risk in all its dimensions of exposure, vulnerability, capacity, hazard characteristics and the environment. It is understood that the knowledge of such risk can be leveraged for the purpose for pre-disaster preparedness and prevention, for mitigation and effective response measures. To achieve this, it is important to regularly assess disaster risks, vulnerability, capacity, exposure, and potential effects in line with economic circumstances and policy conditions specific to an economy. Furthermore, knowledge should be built across government officials, civil society, communities, volunteers and the private sector through awareness building, training and education and peer learning.

Aligned to the *Sendai Framework*, consideration is given to the role and responsibility of all stakeholders involved in crisis management. The primary role is to reduce the disaster risk sitting with federal and state Governments, while acknowledging the critical role that local government, the private sector, and other stakeholders – including the local tourism network play. Their role extends across all areas of understanding risk, strengthening governance to manage risk, investing in risk reduction, enhancing in preparedness, and building back better.

This study has been commissioned by APEC, led by the economies of Peru, Chile, and Singapore, to assess the levels of vulnerability in tourism especially among MSMEs in regional communities. It will explore MSME engagement with ICTs as a tool for disaster preparedness, prevention, response, and recovery.

As the tourism industry continues to feel the impact of COVID-19, the UNWTO maintains that international tourism contracted by 65% in the first half of 2020. This means a recognized loss of USD $460 billion in export earnings from international travel – creating global uncertainty

and placing millions of jobs and countless businesses at risk. COVID-19 is not the only risk that businesses face globally during these ''unprecedented" times. With a rapidly changing climate, impacts of natural disasters are more severe than ever, and with an industry that is often inherently reliant on its natural environment, the vulnerabilities of the tourism industry are exposed.

Now is the time to consider the vulnerability of tourism on a global scale and rethink the systems and structures that support this critical industry. There is an opportunity to examine and transform aspects of business risk management appropriate to MSMEs to build resilience and strengthen the visitor economy for a sustainable future.

This report will first set the scene by exploring the global academic research that has been conducted into tourism risk and management and specifically into the role that ICT plays within crisis and disaster management.

Next, the report examines the role of the major international bodies and agencies, the role they have in supporting crisis and disaster preparedness, prevention, response, and recovery. Furthermore, the report will present practical tools that have been developed to support policy development and businesses in responding to the increasing challenges faced by the industry.

Finally, the report takes a deep dive into the APEC economies, the strategies, plans and research that has been conducted in each of the member states regarding broad crisis resilience and response and where viable, the tourism sector's response, including the use of ICT within processes.

It is important to note that given the time of writing this report, a significant focus of research, analysis and policy response is placed on pandemic response. Whilst some inclusion has been made, the research team has not overwhelmed the document with a focus on pandemic to ensure that learnings across a broad range of crisis and disasters are considered.

Concluding with key learnings, this research report draws together a broad range of insight and a rich history of analysis, policy response and action within the crisis and disaster management realm.

Levels of vulnerability in tourism

The World Economic Forum's (WEF) *Global Risks Report* emphasizes that for all businesses, extreme weather, climate action failure and human-led environmental damage are the greatest risks. Digital power concentration, digital inequality and cybersecurity failure are also likely risks to be faced. Furthermore, the most imminent threats across the next two years include employment and livelihood crises, widespread youth disillusionment, digital inequality, economic stagnation, human-made environmental damage, erosion of societal cohesion and terrorist attacks.

Tourism plays a critical role in reducing risk, building community resilience, and enhancing community connectedness given the nature of the service industry. It is also an industry reliant on a perception of positive image, safety, security, stability, and low risk. Therefore, understanding the vulnerabilities across the tourism network enables businesses, governments, and other critical stakeholders to address vulnerabilities and strengthen overall resilience. However, research indicates that tourism tends to be poorly prepared for natural disasters often taking a passive approach[1]. This is often due to the small and entrepreneurial nature of tourism businesses and owners too busy working in the business as opposed to on the business[2].

It is important to note that resilience and vulnerability are not necessarily on a spectrum. A business, a destination or a community that is vulnerable in certain areas does not mean that it is not resilient. Reciprocally, just because resilience is demonstrated, does not mean that there is no vulnerability.

Vulnerability in tourism takes many forms. Whilst often the physical vulnerability is considered first due to the location of destinations and attractions in areas of outstanding natural beauty, or urban centers[3], vulnerability also comes in the form of financial (both immediate for business and longer term through insurance losses), social (tourism mobility and lack of accountability, language barriers), and reputation through destination image[4]. Tourism as an industry is reliant on a complex network of systems, structures and supply chains including transportation networks, agriculture supply, and electrical and water systems. Disruption across any part of this system can have significant implications for tourism that erode confidence and destination image, while also potentially disrupting travel, at best for the short-term, and at worst causing long-term implications[5].

Research indicates that reputational damage and the perception of danger within tourism can be as damaging as a disaster itself. For example, the impact of the severe acute respiratory syndrome (SARS) epidemic saw outbound tourism to Japan drop by 55% in one month[6].

1 S. Becken, R. Mahon, H.G. Rennie, A. Shakeela. **The tourism disaster vulnerability framework: an application to tourism in small island destinations.** Nat. Hazards, 71 (1) (2013), pp. 955-972, 10.1007/s11069-013-0946-x

2 M. Cooper **Japanese tourism and the SARS epidemic of 2003.** J. Travel Tour. Mark., 19 (2–3) (2005), pp. 117-131, 10.1300/J073v19n02_10

3 N.Brown, J. Rovins, S. Feldmann-Jensen, C. Orchiston & D. Johnston. **Exploring disaster resilience within the hotel sector: A systematic review of literature.** I.J. or Disaster Risk Reduction. 22. (1) (2017). Pp 362-370.

4 D. Nguyen, K.Iuchi & Imamura, F. **Disaster management in coastal tourism destinations: the case for transactive planning and learning.** Int. Rev. for Spatial Planning & Sustainable Development. 4.(2). (2016). 3-17.

5 D. Pearlman, O. Melnik. **Hurricane Katrina's effect on the perception of New Orleans leisure tourists**. J. Travel Tour. Mark., 25 (1) (2008), pp. 58-67, 10.1080/10548400802164905

6 C.-H. Tsai, T.-c. Wu, G. Wall, S.-C. Linliu. **Perceptions of tourism impacts and community resilience to natural disasters** Tour. Geogr., 18 (2) (2016), pp. 152-173, 10.1080/14616688.2016.1149875

Hurricane Katrina in New Orleans resulted in the loss of over 1,400 tourism businesses causing a loss of over USD $15.2 million per day in travel expenditure[7]. In both cases, it was perceived risks among international travelers that impeded recovery.

The changing nature of disaster management needs to be considered in the age of social media, with consumer driven content and reviews shaping and defining the competitiveness of businesses and destinations. In such a dynamic industry, it is critical the disaster management, response and recovery are effective, efficient and supports vulnerable populations. If not, flow on impacts may be significant, in the form of long-term reputational damage such as negative consumer sentiment and word of mouth. Social media can also play an important role in disaster recovery as an effective tool to communicate market readiness. In order to effectively harness this tool, researchers indicate that destination management organizations (DMOs) need to collaborate with tourism operators to promote consistent messaging that supports a clear response.

To reduce the levels of vulnerability in tourism, improvement is required in the levels of education and communication. This will in turn build resilience. To achieve this, knowledge to barriers such as perceived time, awareness of risk and access to resources, the perceived use and perceived usefulness of the resources, and enhanced knowledge is required.

7 EarthCheck Primary Research.

ICT in tourism destination management

The use of ICT has been identified by researchers as strong tools to manage post-disaster activities in developing economies. In Africa, ICT has successfully been employed as a recovery tool in the creation of Management Information Systems (MIS). These systems can facilitate sharing and collaboration between multiple stakeholders. Furthermore, geographic information systems and computer simulations are invaluable tools in supporting recovery in remote areas, in tracking the impacts of natural disasters but also in emergency planning and preparedness[8].

Studies in China demonstrated the power of social media (particularly looking at the use of Twitter – study in 2008 prior to the blocking of Twitter) in disseminating information about earthquakes. The research found that information was shared faster and more effectively than via traditional forms of media in direct response to the earthquake. The research was supported in Nepal (post-earthquake), with social media deemed a powerful tool in recovery efforts[9].

Social media, however, must be used with caution as misinformation can be disseminated quickly in the lead-up to, and immediately post-disaster. DMOs need to work in close partnership with key stakeholders to ensure effective messaging. ICT has also been identified as a vehicle for undermining governance structures and systematically reducing society's ability to reduce significant problems[10].

Reliance on communication through social media channels will need to consider evolving trends of digital detoxing – with adaptive communication being the key to resilient communities[11].

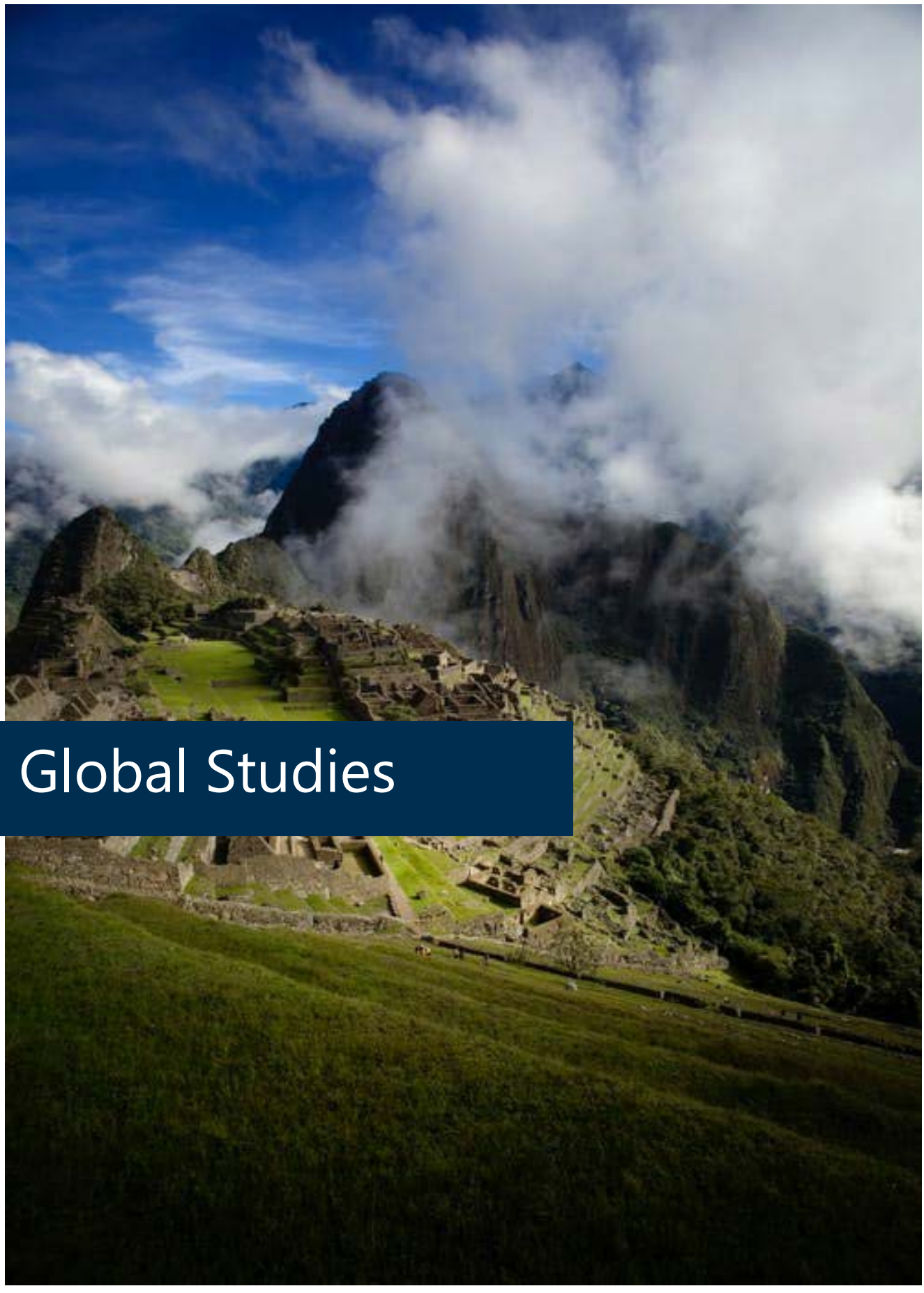
ICT has also directly been utilized to manage tourism flows and visitation in times of crisis. Artificial intelligence (AI) has been used for several years in airports and now in a broader manner to screen, track, predict and survey. As AI grows in roles in

8 Gossling, S. Technology, ICT and tourism: from big data to the big picture. (2021) Journal of Sustainable Tourism. 29. (5).
9 Lama, S & Pradham, S (2018. Enhancing Resilience of Natural, Built and Socio-economic Environments Proceedings of ISCRAM Asia Pacific 2018 (K. Stock and D. Bunker, eds).
10 Li, J., & Rao, H. R. (2010). Twitter as a rapid response news service: An exploration in the context of the 2008 China earthquake. The Electronic Journal of Information Systems in Developing Countries, 42(1), 1-22
11 Zulu, B. (2008), 'African officials urge use of IT for disaster management', Network World Canada, vol. 24, no. 16, p. 1.

virtual guiding and hosting, it is likely that its role in disaster management and supporting visitor flow through challenging times will also need to increase.

Consideration of ICT in preparedness and in supporting tourism operators to build knowledge and capacity is also important. As online learning becomes a norm, whether it is active online learning, gaming, and engagement, or more passively through video content, advances in ICT to support learning have changed the way that tourism operators can build their understanding in disaster management.

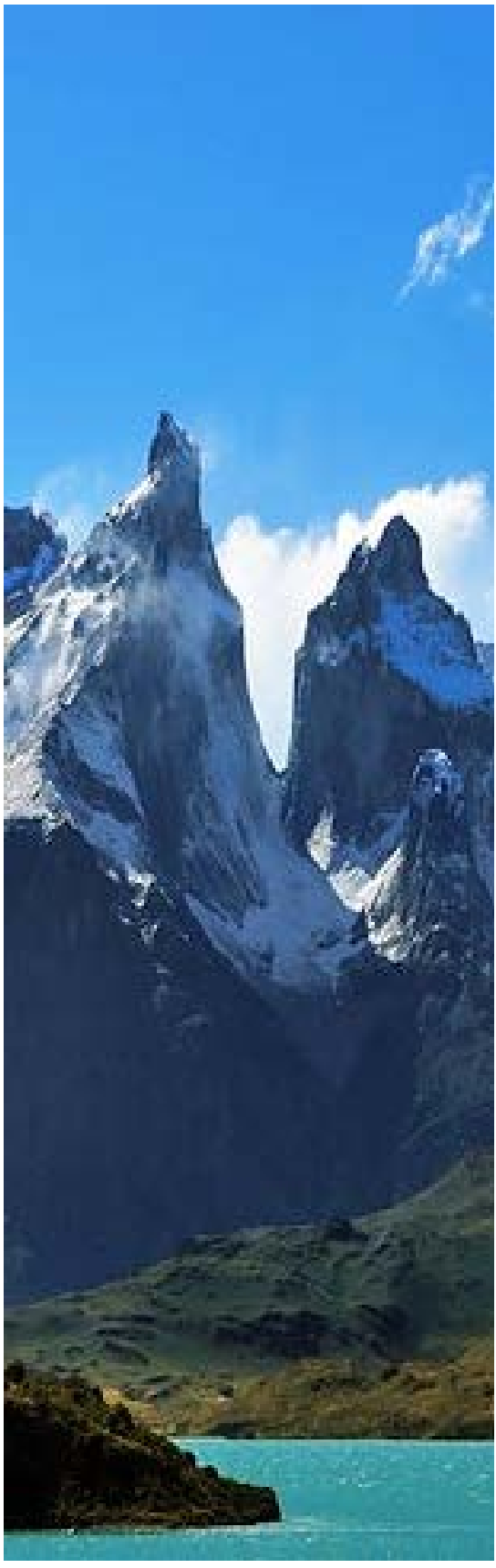
Poverty also adversely affects adoption and use of ICT as a support mechanism for preventing and responding to disasters. Similarly, education of populations and increasing awareness of risk play an important role in ICT engagement and risk prevention.



Global Studies

APEC studies

APEC has conducted several studies into tourism risk management and the vulnerability of tourism including:



APEC Putrajaya vision 2040 (2020)

The vision is for an open, dynamic, resilient, and peaceful Asia-Pacific community by 2040, that creates prosperity for all of the region's people and future generations.

Remaining committed to APEC's mission and its voluntary, non-binding and consensus-building principles, the vision will be reached through:

- Trade and Investment.
- Innovation and Digitalization.
- Strong, Balanced, Secure, Sustainable and Inclusive Growth – the focus of this principal is on building resilience among vulnerable and disadvantaged populations to ensure that all the Asia-Pacific is resilient to crisis, shocks, and disasters.

An implementation plan will be delivered detailing how each of these principals will be achieved.

Prospect analysis for sustainable development of tourism in remote areas of APEC economies – Phase I (2020)

The program aims to improve knowledge and skills of tourism authorities through analysis of different characteristics of remote areas in APEC economies, existing bottlenecks, and tourism capacity potential of these areas without sacrificing their authenticity. The program also develops recommendations for APEC economies on ways to promote 'awareness of remote areas', and aimed to hold a workshop for experience exchange, presenting recommendations dedicated to sustainable tourism development in remote areas of APEC economies.

Whilst not directly linked to disaster resilience or vulnerabilities – the remote nature of the areas in the case study locations (Australia, Philippines, Indonesia & Papua New Guinea) make them naturally vulnerable. The focus on the sustainable future of these destinations supports some consideration of resilience

through risk management and consideration of social, environmental, and economic interactions with the landscape.

Leveraging the digital economy to promote an inclusive tourism industry: workshop summary report (2020)

The workshop explored: key digital tourism trends in the Asia-Pacific region, how digital tools create opportunities for key groups in the tourism economy, including women and MSMEs; how digitalization can enable greater access to the tourism industry, but can also present challenges; and regulations and policies that support growth in the digital economy while mitigating potential negative effects.

An important learning from this workshop was that government and industry collaboratively have roles to play in ensuring access to digital tools, infrastructure and skills required. Governments, with input from the private sector, should pursue policy frameworks that support the benefits of digital tourism while mitigating potentially negative aspects.

Whilst not directed toward disaster and crisis management, those learnings must be brought across to how we engage and collaborate towards a skilled tourism network.

Supporting MSMEs' digitalisation amid COVID-19 (2020)

MSMEs are particularly vulnerable to the economic impacts of COVID-19. Targeting economic relief for small businesses has been a critical component of policy interventions across APEC economies. These interventions have included a range of fiscal and monetary policies, as well as initiatives promoting digital adoption. The COVID-19 crisis is pushing more consumers online and accelerating the adoption of e-commerce – this will require further digital adaptation by MSMEs.

Despite the clear benefits of adopting digitization among MSMEs, it is crucial to recognize the complex challenges presented, including: 1) cybersecurity and data privacy concerns; 2) exposure to digital fraud; 3) online misinformation; 4) asymmetric market power and platform dominance; and 5) persistent digital divide and infrastructure related issues. Supporting MSME's digitalization efforts amid COVID-19 requires policymakers to adopt a two-pronged set of interventions that allows MSMEs to reap the benefits of the digital world while overcoming the challenges.

APEC internet and digital economy roadmap (2017)

APEC economies will concentrate, but not limit, their work on the following focus areas:

1. Development of digital infrastructure.
2. Promotion of interoperability.
3. Achievement of universal broadband access.
4. Development of holistic government policy frameworks for the Internet and Digital Economy.
5. Promoting coherence and cooperation of regulatory approaches affecting the Internet and Digital Economy.
6. Promoting innovation and adoption of enabling technologies and services.
7. Enhancing trust and security in the use of ICTs.
8. Facilitating the free flow of information and data for the development of the Internet and Digital Economy, while respecting applicable specific laws and regulations.
9. Improvement of baseline Internet and Digital.
10. Enhancing inclusiveness of Internet and Digital Economy.
11. Facilitation of e-commerce and advancing cooperation on digital trade.

APEC leaders' declaration, Annex B: APEC services competitiveness roadmap (2016-2025) (2016)

APEC leaders recognize the important role that services will play in the growth of regions over the coming decade. New technologies are increasing the ability to trade in services while creating platforms that allow service providers, such as women and small businesses, to participate in trade. Services are also a growing and dynamic component of global value chains. Together these developments have the potential to significantly increase productivity levels within our economies.

Leaders also recognize the need to address barriers that inhibit our businesses from competing or trading in services markets and undertake concrete actions that will facilitate services trade and investment and enhance the competitiveness of the services sector. Regulations should promote fair competition and the adoption of new technologies.

Tourism risk management: an authoritative guide to managing crises in tourism (2006)

This report provides an essential guide on the processes associated with developing a risk management strategy for a tourism destination or business, and how to implement and maintain these plans over time.

Most importantly the guide provides a practical framework from which both businesses and destinations can apply crisis management strategies for prevention, preparedness, response, and recovery.

Whilst it has limited application to ICT, this guide provides valuable and relevant guidance to support tourism operators in preparing and responding to crisis.

UNWTO publications

Tourism in SIDS: the challenge of sustaining livelihoods in times of COVID-19 (June 2020)

The current crisis can translate into increased poverty and undermine the ability of Small Island Developing States (SIDs) to advance sustainable development and withstand natural disasters, which have been occurring with increasing frequency and intensity. A special program for crisis mitigation and recovery of SIDS tourism is critical in supporting tourism stakeholders to withstand immediate impact of the crisis and navigate through recovery.

Programs that address training, digital transformation and skills, infrastructure maintenance, implementation of health protocols, social protection and business continuity should be at the core of the support devised by the international community to the SIDS tourism sector.

Toolbox for crisis communications in tourism (2011)

Crisis communications is a crucial element of a good crisis management system. It helps limit the negative impact of a crisis by addressing the information needs of all industry stakeholders in an efficient, timely and responsible manner.

The UNWTO provides a *Toolbox on Crisis Communications in Tourism* for National Tourism Organizations (NTOs), DMOs and private sector organizations involved in travel and tourism. The Toolbox offers step-by-step checklists, sample templates configured by type of crisis and media categories, guidelines for measuring effectiveness, best practices and a special chapter dedicated to the use of social media in times of crisis.

The Toolbox is designed as a practical guide for travel and tourism stakeholders to effectively address the challenges generated by crises.

Handbook on natural disaster reduction in tourist areas (1998)

Tourism involves the movement of millions of people to virtually all economies on the surface of the globe. Quite often tourism developments are in areas exposed to, or likely to be exposed to, sudden-onset natural disasters, in particular beach and coastal areas, river valleys and mountain regions. If these developments are hit by natural disasters, the image of the tourist destination will suffer.

The *Handbook on Natural Disaster Reduction in Tourist Areas*, jointly produced by UNWTO and WMO experts, demonstrates how to combat natural disasters in tourist areas and mitigate their impacts. It guides the reader through disaster onset to post-disaster reconstruction and the relaunching of a tourist destination with a build-it-back-better mentality – which is aligned with the Sendai framework.

Tourist safety and security: practical measures for destinations (1996)

Safety and security are vital aspect in supporting high quality tourism destinations. More than any other economic activity, the success or failure of a tourism destination depends on being able to provide a safe and secure environment for visitors. This publication represents the result of a long-term effort by UNWTO. It examines planning considerations at a centralized government and local level. Case studies for principal tourism sectors and ideas for information brochures are also presented.

WTTC publications

Crisis readiness – *Are you prepared and resilient to safeguard your people & destinations?*

Crisis preparedness must focus on building trust-based coalitions, assessing readiness & developing emergency action plans as well as enhancing education. The effective management of a crisis requires the rapid activation of emergency plans as well as quick, accurate and transparent communication. Finally, responsiveness to ensure a speedy recovery should emphasize transparency, readiness and confidence; inviting the world back when ready, enticing travelers to return, building on one's travel segments and rebuilding infrastructure strategically and smartly post crisis.

To recovery and beyond: The future of travel & tourism in the wake of COVID-19

As the sector adapts to the next (or new) normal, research indicates that consideration should be given to policies that incentivize travel, facilitate seamless coordination, and upskill while rethinking what workplaces look like.

As the sector enhances its resilience, governments can strengthen environmental protections, and engage more closely with local communities, while creating and implementing a new vision for the workforce together with the private sector.
Ultimately, to achieve recovery, enhanced coordination within and between governments as well as alignment between the government and private sector, will be key.

Digitise the Workforce – The pandemic has demonstrated the importance of an adaptable and technology-enabled workforce, including an adjustment to remote working, and learning as a new norm. Businesses will need to develop internal technical and digital capabilities to adapt to increasingly digitized operations within the sector. Significant investment in employee recruitment, reskilling, and upskilling is needed to attract, develop, and retain skilled talent. Retention efforts will also be important to ensure minimal leakage.

Enable Non-Traditional Destinations – Government support will be needed to ensure that emerging destinations have adequate resources to re-activate tourism and adapt to evolving demand. Consumers will not be behaving in the way they were pre-COVID-19, and tourism businesses will not be delivering experiences in the same way. Investment in digital infrastructure and effective destination marketing strategies will be key to attract tourism. However, in a competitive and crowed market, the way this is delivered will be critical. While, businesses should play a role through the digital upskilling of the local workforce, government-private-community partnerships will be central to ensuring the sustainable and inclusive growth of these destinations.

Caribbean resilience and recovery: minimizing the impact of the 2017 hurricane season on the Caribbean's tourism sector

This paper on the Caribbean identified how governments across the region can work together with the private sector to speed up recovery through a range of policy initiatives including:

- Increasing access to capital for MSMEs, and easing entry and work permit restrictions for specialized services, which will incentivize the private sector to speed up recovery.
- Increasing duty-free exemptions on commonly purchased goods and reduce tourism costs such as departure taxes and resort fees. This will stimulate travel and traveler spending.
- Improving the ease and experience of traveler arrivals and departures through use of technology in airports and visa facilitation, which will increase customer satisfaction and the attractiveness of the region.
- Investing in tourism sector training and education to sharpen and upgrade the skills of temporarily displaced workers. This will ensure the sector has access to a skilled workforce as it recovers and grows.

Case Study: Pacific Asia Travel Association

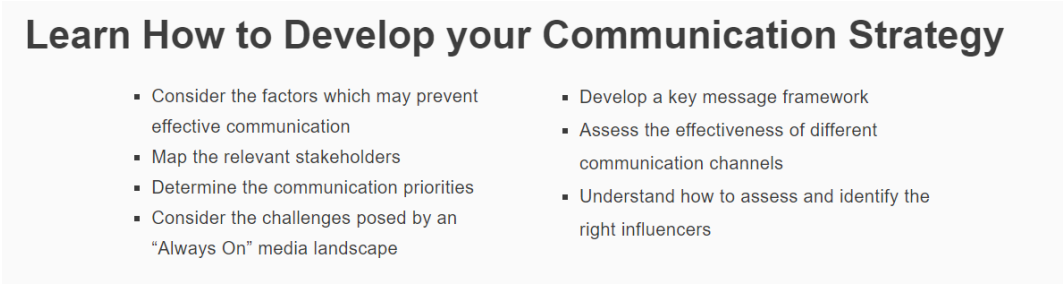
Crisis Resource Centre (2020)
The Pacific Asia Travel Association (PATA) Crisis Resource Centre offers a set of freely accessible resources that aid rapid, robust and responsible tourism across the Asia Pacific region.

The digital platform was launched in 2020 in response to the COVID-19 pandemic to facilitate access to a comprehensive world-class digital resource for crisis response management.

The tool offers a Recovery Planner, Communication Strategy Guide, Communication Planner and sector specific kits to reignite recovery.

Through the online platform, operators can also reach out directly for specific guidance and support with recovery plans.

A suite of webinars are online available to support tourism operators, providing on-demand learning opportunities through the web platform.



Implications
This digital resource center addressed the specific needs of the tourism industry in response to the COVID-19 pandemic. It provides knowledge, insights and resources targeted at tourism operators across the PATA membership base. Supporting operators to engage with the content, access the resources and utilize the resources to prepare, respond and recover within their own business is critical. This is a strong example of an accessible use of ICT in the tourism industry.

Inter-American Development Bank (IDB) studies

Sustainable islands: defining a sustainable development framework tailored to the needs of islands (2020)

Small Island Developing States (SIDs) are vulnerable to external shocks. The recent pandemic emphasized the structural problems that exist due to the remote location, small size, global supply chain and heavy reliance on service-based economies. The report identifies the extreme vulnerability of SIDs and the need to rethink their approach to development, adopting a more sustainable approach. The approach should consider SIDs as big ocean economies, enabling sustainable economic growth and restoring ecosystems through biotechnology, renewable energy and ocean tourism and leisure.

The report posits that by taking a systems approach, focusing on big oceans (as opposed to small landmass), can create a pathway to resilience and create opportunities not previously open to economies. Connectivity and partnerships are key to supporting the desired outcomes, working collaboratively towards mutually beneficial – sustainable and resilient outcomes.

Extreme outlier: the pandemic's unprecedented shock to tourism in Latin America and the Caribbean (2020)

The sectors most vulnerable to the pandemic are international trade in goods, services, and financial flows. For economies such as Latin America and the Caribbean that are heavily reliant on commodity exports and tourism, the impact has been heavily felt.

The region is no stranger to crisis. Shocks have been felt over the past two decades with terrorism (9/11 attacks), severe acute respiratory syndrome (SARS), Global Financial Crisis (GFC), the 2009 flu pandemic (H1N1), Ebola and Zika. Whilst each of these crises negatively impacted the flow of tourism, the only significant impact prior to COVID-19, was that of the GFC creating a 4% decline in visitation across Latin America and the Caribbean in 2008-2009.

The paper highlights the need for policy focus on interventions aimed at protecting employment and insulating tourism businesses from the negative impact of COVID-19, to ensure that once the shock is over, that those critical stakeholders will be again able to play vital roles in the future.

The paper acknowledges that whilst nothing can be done to replace or stimulate demand for tourism in the short term, protection of the industry and support for those employed across the sector should be a priority in economies with a focus on service economies.

The fear factor: A back-of-the-envelope calculation on the economic risk of an Ebola scare in the Caribbean (2014)

Highly vulnerable economies: Bahamas, Barbados, and Jamaica, are very reliant on tourism visitation and expenditure. The impact of Ebola, with or without the destinations being physically impacted by the disease is significant. Even a small scare regarding a potential outbreak will have a severe impact on visitor numbers to small Caribbean economies, thereby impacting livelihoods, causing economic and social damage. The report simulates that an assumed Ebola outbreak would cause a sharp drop in tourism arrivals for 3 months – a small outbreak leading to a scenario of 25% decline in visitation, whilst a large outbreak leading to 75% decline. The economic implications of such declines could lead up to a 2.9% decline in Gross Domestic Product (GDP) for economies – with smaller shocks resonating 0.2% declines in GDP.

The research highlights the intense vulnerability of small economies with high service-sector reliance. There is an identified need to build resilience and adaptability into their economies to protect residents from experiencing long-term implications from crisis events. Further work to build resilience, to embed emergency protocols and to support businesses in continuity planning is required.

Building Morocco's resilience inputs for an integrated risk management strategy (2013), World Bank

The report explores work undertaken to support Morocco's evolution to improved risk management across natural disasters, commodity (energy) price volatility and agriculture risks. Natural disaster risk was considered the greatest threat, and therefore most extensively addressed with costs averaging MAD $5.0 billion annually. In considering risks, Morocco identifies three key pillars, catastrophic risk, commodity risk and agriculture risk. By taking an integrated risk management approach, Morocco was able to build awareness across the community of key risk. I Government geo-mapped key areas of vulnerability and cross cutting collaboration was achieved through the development of the Centre of Risk Excellence.

World Bank studies

Inclusive resilience: inclusion matters for resilience in South Asia (2021)

South Asia is identified as being incredibly vulnerable, and although many economies have disaster risk management policies, programs, and plans in place that commit to promoting social inclusion, the report indicates that a gap exists between policy and implementation. Throughout the risk management cycle of prevention (mitigation), preparedness, response, and recovery, measures need to be designed and implemented to reflect the needs, capabilities, and voices of socially excluded groups. Only after these gaps between policies and actions are addressed will it be possible to ensure the resilience of all people to withstand climate- and disaster-related impacts in the future.

Gender dimensions of disaster risk and resilience: existing evidence (2021)

Gender impacts the way we are affected by disaster and capacity to withstand and recover from them. Yet disaster risk management policies, designed to maximize results, bare no consideration to gender dynamics. The report highlights the need for policy makers and practitioners to understand the influence of gender more effectively on disaster response and recovery. Furthermore, the report highlights the need to better design policy and programs that supports all stakeholders to build resilience and ready themselves for the next shock.

Lifelines: the resilient infrastructure opportunity (2019)

The report explores work undertaken towards an integrated risk management approach. Five basic recommendations are put forward to assess infrastructure developments moving forward:

1. Get the basics right – ensuring the policy foundation is in place to deliver positive outcomes.
2. Build institutions for resilience – taking a whole of government approach.
3. Create regulations and incentives for resilience.
4. Improve decision making – data driven.
5. Provide financing – with a transparent approach.

Competing in the digital age: policy implications for the Russian Federation (2018)

The emergence of new technology presents economies with opportunities but also challenges in government policy making. The role of government becomes a balance between protecting the interests of people with harnessing emerging technologies to take advantage of Russian competitiveness and to accelerate economic growth.

This report focuses on Russia's challenges and successes with technology and the rapid adoption of new technology across all key areas of competitive strength.

Specific policies should be implemented to encourage innovation and entrepreneurship in the digital transformation context. Sustainable innovation requires close coordination between the government, the private sector, and the academic community.

"We need a culture of prevention, no country can fully insulate itself from disaster risk, but every country can reduce its vulnerability. Better planning can help reduce damage—and loss of life—from disasters, and prevention can be far less costly than disaster relief and response."

—World Bank Group President Jim Yong Kim

World Bank studies & initiatives

Unbreakable: building the resilience of the poor in the face of natural disasters (2017).

Whilst the reporting of aggregated losses from disasters is important, it fails to detail the impact on people's wellbeing and explore the marginalization of poor people who are disproportionately impacted by natural disasters.

This report explores the use of a consistent framework to assess transitional approaches to reducing disaster risk (such as building reinforcements) and strengthening resilience to help design more effective risk management policies. Findings include those efforts to reduce poverty and disaster risks are complementary and should be considered as part of the disaster risk management toolkit. Broad based disasters that influence entire economies also impact wellbeing more severely than traditional estimates suggest. Policies that enhance resilience and recovery from disaster should be implemented to create savings.

Disaster risk management in South Asia: a regional overview (2016)

The report identifies damages caused by natural disasters are exerting more pressure on redevelopment needs. Government expenditure is being placed under an increasing level of stress by a repeated need to reallocate budget from long term planning to reconstruction activities post-disaster.

Investing in urban resilience: protecting and promoting development in a changing world (2016)

Rapid growth of cities in the developing world has boosted economies, reduced poverty, and fueled global prosperity. However, as people, assets, and economic activity become concentrated in cities, infrastructure has struggled to keep up with rapid growth and the risk posed by natural disasters and climate change has risen.

Research indicates over the next 15 years, at least 400 billion dollars will be needed annually to support city infrastructure transition to low-emissions and build resilience to the wide range of shocks and stresses. While, over the last five years, the World Bank Group has financed more than $9 billion in projects to help cities in 41 economies become more resilient, significant investment gaps remain. To overcome these gaps, a critical role in enabling city and Federal governments to leverage private investment is required.

Strong, safe, and resilient a strategic policy guide for disaster risk management in East Asia and the Pacific (2013)

Poorly planned urban sprawl puts more people at risk than ever before, and cities have become disaster hotspots. Cities are also part of complex supply chain networks; this can create disruption and cascading disasters that reach far beyond the immediate disaster zone. Preventative investment in risk reduction and disaster risk management is an extremely cost-effective way to reduce the impact of natural hazards.

Policy, planning, and strategy needs to consider disaster management and resilience building, actions based on risk reduction should be prioritized. Investments that support communities to develop effective disaster and risk management strategies need to be implemented to strengthen the region.

Longer-term consideration is required to risk-based land-use planning and consideration of implications of coping mechanisms for vulnerable and poor residents.

The report also noted the importance of iterative learning, continual improvement and adapting response, and embedding new technology to better respond to changing circumstances.

World Bank initiatives in APEC economies

Philippines
World Bank and Global Facility for Disaster Reduction and Recovery partnered with the Philippine Government to establish a Philippine Asset Registry System, covering 400,000 government invested assets across five agencies to systematically manage financial risks to assets.

Indonesia
World Bank and GFDRR provided technical assistance for flood hazard modelling across three cities – considering population growth, climate change effects and city level resilience strategies.

OECD studies

COVID-19, international mobility and trade in services: The road to recovery (2021)

COVID-19 has dramatically disrupted international mobility: border closures, visa restrictions, quarantine requirements and flight suspensions have played havoc with the cross-border movement of people. Reduced mobility drove a collapse in services trade. The drop has been unprecedented in magnitude and has had economy-wide impacts.

International coordination can restore safe cross-border mobility. The pace and the strength of the recovery will depend to a large extent on a rebound in the services sectors, underscoring the importance of coordinated border health protocols and mutual recognition agreements. International travel restrictions will need to be lifted as soon as sanitary conditions allow, and international cooperation in lifting these restrictions will further strengthen the economic recovery.

The Impact of COVID-19 international travel restrictions on services-trade costs (2020)

This report casts light on the impact of regulatory restrictions on the movement of people across international borders on services trade costs. Such restrictions were implemented on health and safety grounds following the COVID-19 outbreak in March 2020. The analysis relies on several illustrative scenarios in which all the economies are assumed to close their borders to passengers but leave freight trade open. Services trade costs are estimated to increase by an average of 12% of export values across sectors and economies in the medium term in such a hypothetical scenario. The analysis identifies a large variability in the increase in services-trade costs across sectors and across economies, reflecting the stringency of initial regulations and the relative importance of business travel and labor mobility to international services trade.

Easing of COVID-19-related international travel restrictions, when health and safety considerations permit, will ensure that trade in services, which is highly intertwined with manufacturing in global value chains, can support the recovery. Increased investment in digital infrastructure will also help the adjustment to new working arrangements.

Leveraging digital trade to fight the consequences of COVID-19 (2020)

The current crisis has accelerated digital transformation and underscored its importance for mitigating the economic slowdown, sustaining wellbeing, and speeding up recovery. Trade can help enable digitalization by reducing the cost of access to digital networks, enabling access to the devices through which we connect to the Internet and facilitating access to goods and services via trade.

The report identifies digital technologies can be leveraged to enable more efficient movement of goods, including parcels across borders. Furthermore, access to digitally enabled services can help mitigate some of the side-effects of the COVID-19 crisis and fast-

track recovery. However, barriers that affect digitally enabled services (e.g., barriers affecting online payments) have been growing in recent years.

Political implications include the identification that the crisis has underscored the need to address existing digital divides to allow more people to take advantage of digitalization. To facilitate activities under mobility restrictions and ensure that the gains from digitalization can be realized and more widely shared across economies and societies, greater political focus is required. This is especially important in enabling an inclusive recovery.

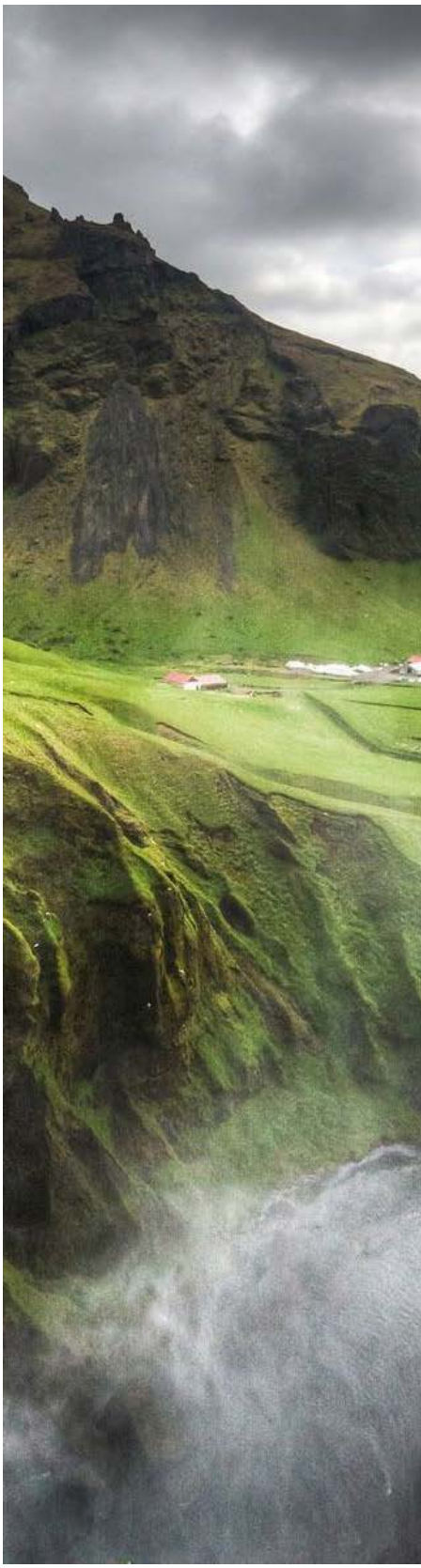
Today, digital engagement is more important than ever, not just to ensure that economies can respond to the immediate issues raised by the COVID-19 crisis, but also to enable an inclusive recovery as soon as possible.

Financial management of earthquake risk (2018)

The report explores the significant impact of earthquakes with over 8,000,000 people losing their lives since 1990 and a cost of more than USD $34.5 billion in damages annually. The impact of earthquakes creates liabilities for governments in costs for emergency response, recovery, repair of assets, financial assistance, and compensation to support those in need. Such costs have an impact on finances into the future. However, insurance arrangements for earthquake risk in most economies do not cover the loss and damages. Government efforts are required to incentivize new seismic-resistant building technologies, support strong building codes, identify the structures that are most vulnerable to earthquakes and secondary perils, and encourage risk reduction investments that can make an important contribution to reducing the level of exposure.

Risk management and corporate governance (2014)

The report overviews the corporate governance framework and practices of corporate risk management across 27 jurisdictions that participate in the OECD Corporate Governance Committee.



Results identify that the cost of risk management failure is still underestimated both internal and externally, including the cost related to management time required to rectify the situation. Corporate governance is required to ensure that risks are understood, managed, and communicated where appropriate.

Findings of the research suggest that risk governance tends to be at a very high-level thereby limiting the usefulness. Consideration needs to be given to operational risk to ensure understanding and applicability.

The integration of risk management frameworks across businesses needs to become common practice, but the skills and knowledge also need to be in place to support boards, committees, and management to understand the risk and what they mean for operation of businesses. More needs to be done to integrate risk management as a business-as-usual practice.

Boosting resilience through innovative risk governance (2014)

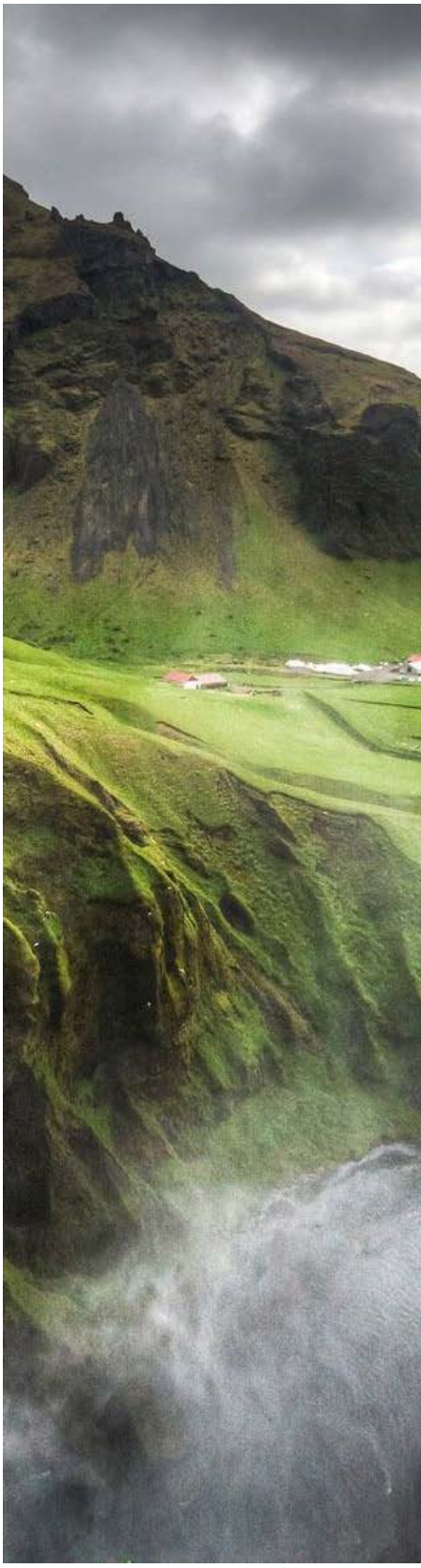
Impacts from natural disasters in Brazil, Russia, India, and China (BRIC) economies over the last decade has cost over USD $1.5 trillion in economic damages. Despite progress in reducing disaster impacts, socio-economic costs are still considerable. Single shocks may cause damage in excess of 20% of GDP, thereby undermining trust in governments. However, such significant shocks can and should be an opportunity to showcase strong governance and long-term commitment from government to protect its citizen, thereby strengthening trust.

Positively, nearly all OECD economies, systematically consider disaster risk in sectoral government investment strategies and planning, mainstreaming risk management policies across sectors.

The research, however, identifies significant gaps in risk regulations not keeping up with changing risk environments and shortcomings in enforcing risk regulations. There are also issues with a lack of business continuity planning and an underinvestment in disaster prevention, an

over-reliance in global supply chains creating vulnerability and a lack of investment among individuals and households creating an over-exposure to risk.

Recommendations highlight the need to increase resilience through prevention and mitigation. An inclusive approach is required that supports the building of trust, rewards cooperation and proactive behavior and monitors and responds to evolving conditions.



Review of risk management policies in Morocco (2017)

For over a decade Morocco made significant efforts to enhance its resilience through adoption of OECD recommendations on the governance of critical risks.

In Morocco, the adoption of the framework resulted in pilot initiatives run by local authorities that improved risk management systems and adoption of international standards. However, governance gaps remained due to a focus on a single risk focus and/or a sector specific focus.

Research indicates that a more effective approach could be supported through cross-cutting, inclusive approaches to risk management that translate across multiple risks and industry sectors – a holistic approach to risk management.

Further recommendations were made by the OECD including: development of a long-term holistic strategy and vision for risk management; the establishment of a Moroccan risk assessment program for all risk-related policies; strengthening of risk culture among government decision makers, citizens and businesses; the development of a framework to incentivize prevention and resilience efforts; enhance the preparedness of stakeholders and adopt budgetary measures to sustain disaster risk financing.

Case Study: Preparing for Disaster – Turkcell

"Disaster risk reduction cannot be achieved overnight but by long-term strategy visioning. Turkey prepares strategies and action plans in order to approach disaster risk reduction issues systematically".

Turkcell is Turkey's cell carrier and plays a critical role in disaster response and recovery. This case study overviews the role Turkcell played in the aftermath of the Van earthquake in 2011.

Disaster preparedness

After a suite of disasters in the late 90's, Turkcell identified the need to respond to the challenges faced by communities and integrate a disaster response that supports business infrastructure and builds resilience across businesses reliant on its infrastructure.
Since that time, Turkcell developed its business continuity management system, built in accordance with ISO22301 standards.

Within their internal crisis response team, individuals must have at least 3 years' experience at Turkcell and specific expertise within their department. Coordination between departments and communication identified as key within the response and recovery processes.

Local responses

Turkcell works in partnership with universities and emergency response from various departments to share lessons, workshops, planning and disaster exercises. Furthermore, the teamwork with international agencies around network initiatives to share innovative technology, applications, and employee training to strengthen institutional preparedness.

Simulations

Every six months, a disaster simulation is run unannounced with up to 1200 staff. For example, as a simulation the group utilized an earthquake scenario in the tourism hotspot of Bodrum – recognizing the importance of including non-resident populations. Staff members are required to respond to infrastructure challenges, loss of life and reactivating services as effectively as possible.

Approximately 100 mobile stations are utilized in support of crisis response, fitted with robust technology to withstand the risk of further damage and to decrease the chance of failure. Alongside mobile stations, there are also technical containers that can be used as command centers fitted with laptops, data lines, generators, power supplies, fixed line and satellite phones, and desks and chairs. After the Van earthquake, a secondary range of life containers were integrated into the network with plumbing, washing facilities, kitchens, and bunk beds to provide families and workers somewhere safe, warm and clean to rest and recover.

Implications

Turkcell is a strong example of a private organization working effectively with key partners across Turkey to deliver a strong disaster response. Preparation is key, with regular training drills ensuring that all team members are ready to respond to the crisis that may come their way. Turkcell is an ICT company and therefore ICT is embedded across all levels of preparedness, response, and recovery efforts. It is important to consider that the organization is continuously improving, reflecting on past disasters, and enhancing response based on challenges and opportunities identified.

Example of Turkcell crisis response to earthquake in China:

- 1069 roaming customers identified within 21 minutes
- Suspended (non-paid) accounts reactivated for 15 days
- Free calls and SMS for all 1069 subscribers within 30 minutes
- Care calls to all subscribers within 6 hours and 8 minutes

Summary of global aid & bodies studies

Based on the overview of global aid, research, visioning, strategies, and tools to date, there is a strong intent across member states to build regional and MSMEs' resilience. Whilst digital and ICT does not play a centric role in many cases, there are underpinning and supporting roles that it plays in delivering, responding to crisis, and providing the data required for decision making that strengthens the understanding of disaster events .

There is also some duplication in work conducted, especially across agency bodies. Ensuring that outcomes are practical and supporting MSMEs to strengthen disaster resilience through clear key performance indicators will provide greater strategic intent.

Existing work has focused on traditional (non-digital based) mechanisms for crisis and disaster management. It is, however, important to note that there is a global alignment to the *Sendai Framework* for disaster risk reduction.

i. Understanding disaster risk;
ii. Strengthening disaster risk governance to manage disaster risk;
iii. Investing in disaster reduction for resilience; and
iv. Enhancing disaster preparedness for effective response.

Whilst there is a limited focus on digital or ICT engagement across crisis management and the vulnerabilities of tourism businesses in member economies, the learnings from recent projects are important considerations in this project. In particular, the need for business and government collaboration and engagement in achieving successful uptake in digital innovation. Government engagement is required to ensure relevant infrastructure is in place – this will be especially important in regional and remote communities – whilst business and other tourism stakeholders (e.g., DMOs) engagement will be required for capacity building and program participation. Failure to engage all parties is highly likely to result in limited take up due to the significance of the barriers restricting participation access.

Learnings from disaster management in Europe indicate that visitors are not aware of the personal risk that they face when visiting destinations. They are reliant on their guides and accommodation providers for disaster preparedness and response.

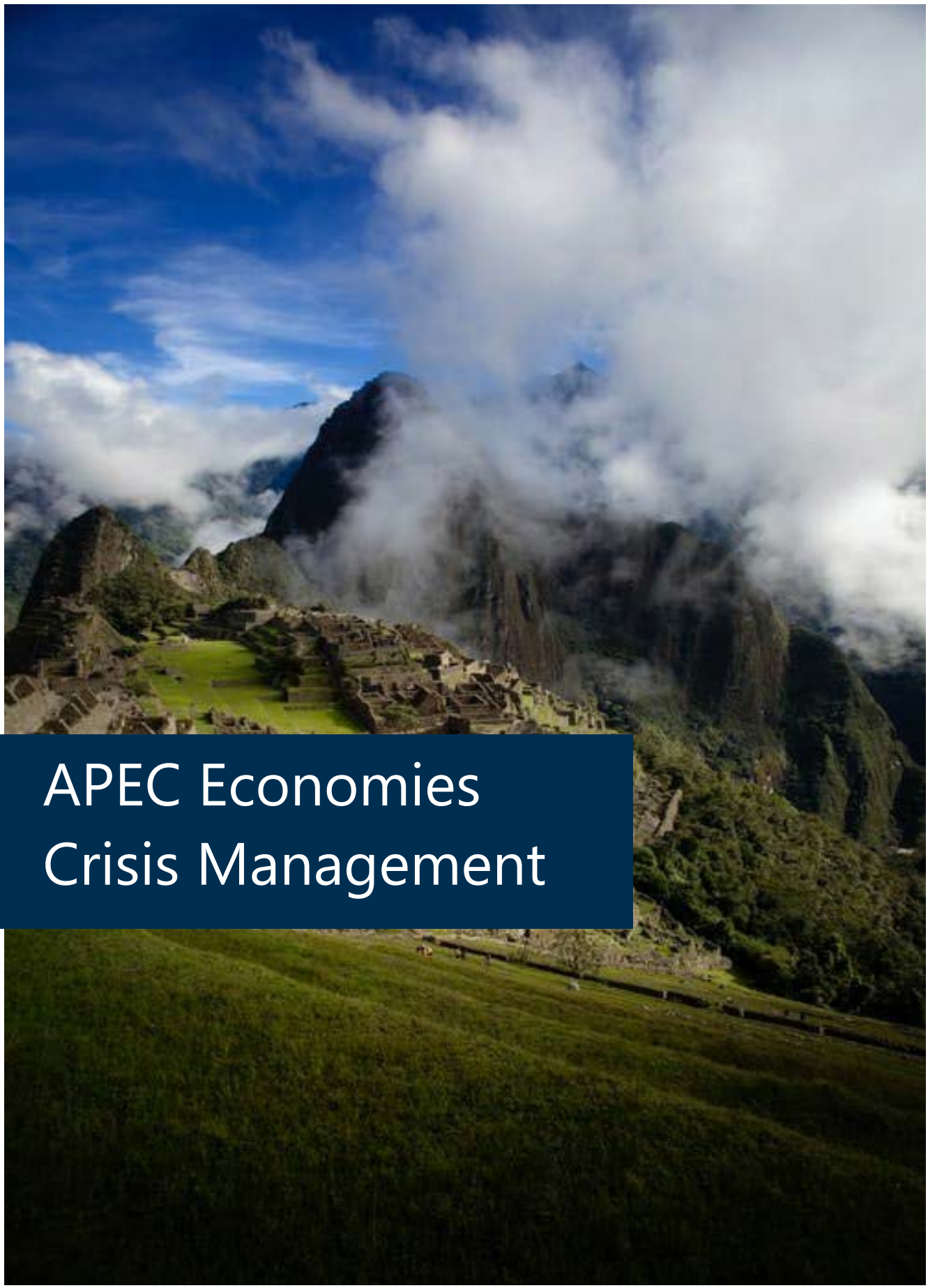
Operators are more likely to engage with preparedness guidelines and toolkits if they are involved in the process and development of the programs. Failure to embed key stakeholders in the process alienates operators and creates a barrier to uptake.

Regular training, upskilling, or capacity building is also identified as a critical step in disaster preparedness to ensure that staff and visitor safety is maintained. Proactive learning about risk reduction and disaster response is unlikely to happen across the tourism industry. Identifying private partners to deliver training or support capacity building will be key to engaging industry in such practices. This is something identified not just across the tourism sector, but the flow-on impact into communities is also rather critical.

Communication, both internal (staff) and external (visitors) needs to be carefully consider and positioned to ensure maximum effect. It needs to be bold and attention seeking to stand out in crowded spaces. Messaging needs to be considered in a way that is informative without scaremongering. Effective communication, pre, during and post disaster is critical. ICT plays a strong role here but needs to be done with care and tact.

As the global approach to integrated disaster management and engaging and collaborating across Government's becomes the normal crisis management practice, it is important that tourism has representation across this decision making, and that the impacts on the tourism sector are fed into risk management strategies for economies. It is evident from the research that the tourism sector is at a high level of risk given the nature of the industry; the population it deals with is vulnerable (both the visitors away from their home, uncertain of how to respond, and many MSMEs with limited financial support).

Tourism plays a critical role in global economies, and therefore needs a presence as risk profiling and management strategies are put in place to ensure the unique needs of the sector (and the flow-on linkages through the supply chains) are considered.



APEC Economies Crisis Management

Australia

Tourism crisis communication toolkit (with case studies)
This toolkit assists Regional Tourism Organizations (RTOs) and DMOs prepare for, respond to, and recover from potential crises and disasters. It outlines the roles, responsibilities, and suggested actions to manage disaster events.

Key Steps:
- Pre-crisis preparation
- Crisis response
- Post-crisis recovery
- Media protocols and crisis communication tips
- Crisis response and messaging for different hazards & disasters
- Crisis led agency roles and contacts

Case studies:
- COVID-19
- Shark attack – Tourism Whitsundays
- Bushfires – Binna Burra
- Cyclone Iris – Mackay Tourism
- Floods – Townsville Enterprise

The Queensland resilience, adaptation pathways and transformation approach project (QRAPTA)
In May 2018, the Queensland Reconstruction Authority (QRA) released Resilient Queensland 2018–21 – Delivering the *Queensland Strategy for Disaster Resilience* as the state-wide, whole-of-government implementation plan to strengthen Queensland's resilience to natural disasters, with the objective to make Queensland the most disaster resilient state.

In August 2019, QRA commenced a project with Commonwealth Scientific and Industrial Research Organization (CSIRO) to strengthen engagement with the Resilient Queensland strategy and look for ways to harmonies resilience and adaptation across state agencies. The program delivered:

- An engagement process to foster cross-agency interaction
- A compelling narrative about the importance of resilience for Queensland
- A resilience framework for Queensland to give a more consistent understanding and application of the concept of resilience across state agency stakeholders, and what this means in a pragmatic way in terms of the vision, goals, objectives, and decision criteria across agencies in Queensland.

Climate change impacts & risk management a guide for business and Government
This document is a guide to integrating climate change impacts into risk management and other strategic planning activities in the Australian government and private sector organizations. The purpose of this Guide is to assist Australian businesses and organizations to adapt to climate change.

Resilience Queensland case studies

Helping communities strengthen their resilience to disasters is a key focus for governments and community organizations across the state. Engaging the community in meaningful ways can be a challenge, particularly if a disaster has not occurred in recent times. The stories showcase examples of how different communities are being encouraged to learn about local disaster risks and take positive steps to be prepared and stay safe.

The case studies are grouped into the following categories:

- Education and Preparedness
- Reaching out to Vulnerable Communities
- Helping Communities Understand Their Risk
- Community Wellbeing
- Resilient Infrastructure

Whilst not specific to the tourism category, community wellbeing, education and preparedness and resilient infrastructure, all touch on aspects of the tourism industry.

National strategy for disaster risk reduction

The *Australian National Disaster Risk Reduction Framework* guides a whole-of-society effort to proactively reduce disaster risk to minimize the loss and suffering caused by disasters.

This framework is designed to guide Australia's efforts to reduce disaster risk associated with natural hazards. It translates the first three Sendai Framework priorities into action for the Australian context; though the strategies outlined in this framework are applicable to disaster preparedness and recovery efforts. The fourth priority of the Sendai Framework is largely progressed through Australian strategies, primarily the *Australian Disaster Preparedness Framework*.

THRIVE 2030 Strategy

As Australia's THRIVE 2030 tourism strategy notes, the visitor economy is subject external forces including economic, security, climatic and health considerations. While the pandemic will influence immediate direction, other disruptive forces will continue to challenge. Extreme weather events, such as cyclones and bushfires, will impact infrastructure and travel confidence. With guidance from the National Climate Resilience and Adaptation Strategy, visitor economy businesses can build resilience by embracing methodologies that prepare for future climate challenges. The visitor economy can make a virtue of utilizing sustainable practices to engage visitors, help protect against future challenges, and leverage natural assets to educate visitors about the importance of sustainable practices and embrace regenerative tourism opportunities. Specific actions identified include - *Encourage businesses to implement resilience and crisis management plans* alongside *Implement measures to address emissions reductions, and climate resilience and adaptation including through Australia's Long-Term Emissions Reduction Plan and the National Climate Resilience and Adaptation Strategy,* with the first action noted above to be carried out by Australia's National Recovery and Resilience Agency.

Case Study: Don't Risk It

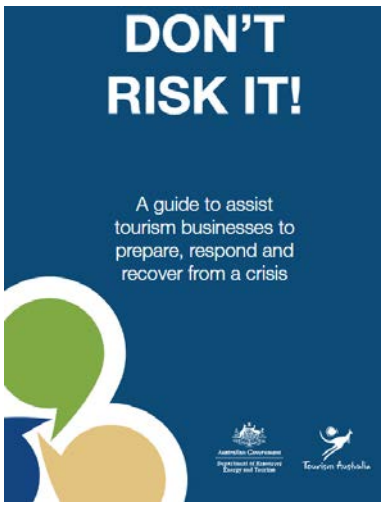
This guide is designed for use by any tourism business looking for assistance to prepare for, respond to, and recover from a crisis. It has been prepared for owner-operated businesses, as well as those with a larger number of employees.

Don't Risk It was commissioned by the Federal Government and Tourism Australia in partnership with State Governments to support tourism business throughout Australia.

The guide does not endeavor to provide advice on every type of crisis event or business but provides generic information that can be applied to business's specific circumstances. This guidebook takes a timeline approach following three phases of crisis management - PREPARE, RESPOND and RECOVER.

The Guide highlights the need for preparation, as when a crisis occurs, it is too late to think about what to do. The Guide provides an overview of how to plan to manage risk, explores how to share the load with colleagues or other appropriate stakeholders, and plans the emergency response and how to stay in business. The response stage provides practical steppingstones for the first 24 hours and the following 2-14 days. Finally, the recovery phase guides businesses through managing cash flow, staff, and marketing. It provides templates and checklists to assist businesses in prevention, preparation, response, and recovery.

The guide has been funded for update in the second half of 2022.



Case Study: CrisisReady – MSMEs in Queensland, Australia

Funded jointly through the Australian Federal Government and the Queensland Government through the 2019 Queensland Bushfire Community Recovery Package under Category C Disaster Recovery Funding Arrangements, the CrisisReady program is being utilized by MSMEs across the state of Queensland on Australia's east coast.

Utilizing a cell phone application as a disaster management headquarters, the CrisisReady program is designed specifically with tourism operators in mind to reduce the stress associated with crisis response and to encourage efficient recovery.

The program:
In Australia, 75% of tourism businesses are sole traders or micro businesses with less than 5 employees – when it comes to crisis preparedness, major constraints include lack of time, knowledge and personal. Additionally, the wealth of available resources can be overwhelming, and many operators end up not being appropriately prepared for crisis events.

EarthCheck developed the CrisisReady App, part of the CrisisReady program, to transform an individual's smartphone into a disaster management headquarters. The app holds all essential information to respond, and to get a business up and running again after an incident or crisis. It takes the stress out of crisis response and simplifies crisis management for MSMEs, providing an individual pathway to recovery.

To support the app, capability building webinars offer simple strategies and business planning activities that MSMEs can implement prior to, during, and after a crisis strikes. The program follows the Australian Government's Prevent, Prepare, Respond, Recover, model of crisis management and is designed to build business resilience and preparedness. Research indicates that for every dollar invested in crisis preparedness, six are saved in recovery.

"Long term, the new CrisisReady app will be a very important resource to assist businesses like mine to plan for, and then mitigate the risks that all business owners face."

– Ben Atherton - Small Business Manager

Program delivery:

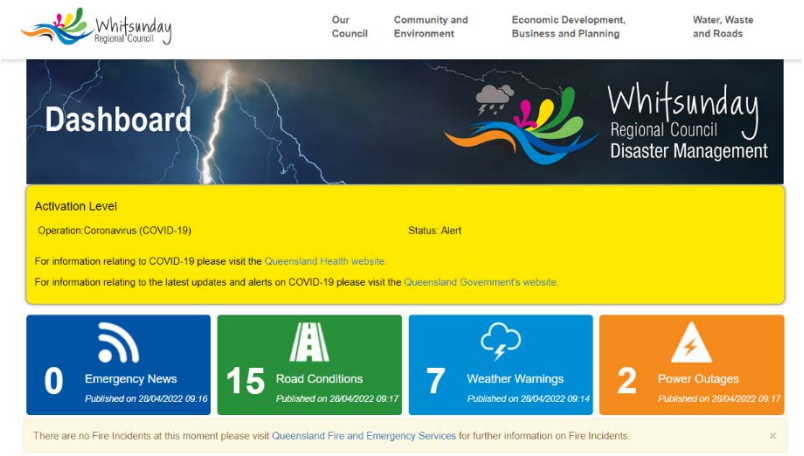
- Customized (fully branded) app for the tourism destination, including regional content such as risk management plans, documents, resources, and key contact details.
- Launched with extensive promotion. The App is provided free for tourism operators to download and to use for a specified agreed timeframe (typically two (2) years).
- Supported with additional capability building resources including tourism specific handbooks such as *Your Business Kit: A Guide to Managing Your Response* and *Business Continuity Plan Template* as well as a series of micro-learning webinars.

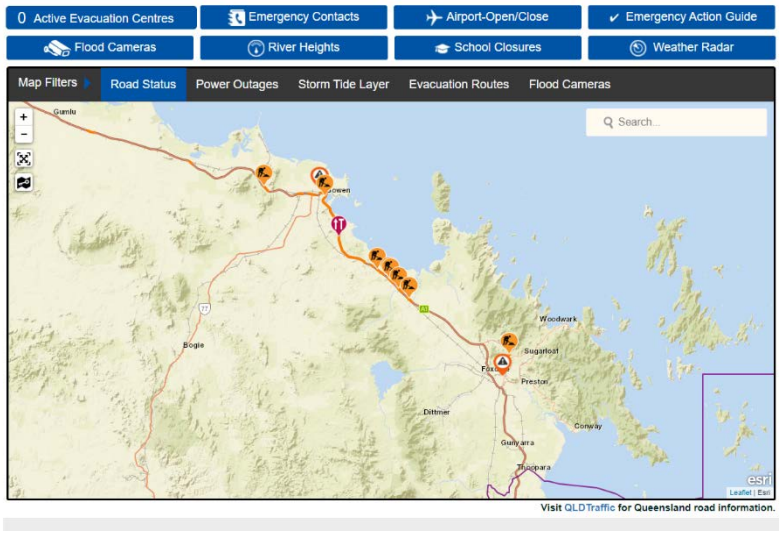
Outcomes:

- The CrisisReady program aims to build the capability of tourism operators to prepare, respond and recover from a crisis event by providing them with education, knowledge, and an easy-to-use crisis management tool – the CrisisReady App.
- The program triggers operators to integrate crisis management practices for 'business as usual' and supports them to develop their own business continuity plan.

Case Study: Disaster Dashboards

In Queensland, Local Councils are the first point of contact for communities in time of a natural disaster. To provide a centralized authority of truth, each Local Government has a Disaster Dashboard providing up to date localized information to prepare and support their communities through challenging times.





The webpage provides interactive mapping solutions that showcase road-closures, disaster events, and other impacts. Key messaging from the Local Government is pushed through this site as well as up-to-date weather information from the Bureau of Meteorology.

Whilst not specifically for tourism operators or MSMEs, this webpage acts as a central source of truth during significant disaster events. Where evacuations are required, it enables tourism businesses to provide visitors with relevant, safe information to ensure that evacuation is seamless.

The disaster dashboards also include information about evacuation center openings and locations, river heights, road conditions and closures, power and phone outages and helpful contacts.

In times of no disaster, Get Ready messaging is also available to support community members in preparing for disaster events.

Case Study: Crowd Sourcing

In September 2019 Binna Burra Lodge, located close to the Gold Coast, Australia, was devastated by unprecedented bushfires ravaging through typically damp forest. Binna Burra Lodge is a heritage listed site and eco-tourism certified business, offering a range of accommodation options and event venues. Located within Lamington National Park, part of UNESCO World Heritage listed Gondwana Rainforests of Australia, this area is a popular venue for nature-based tourism activities.

On the 6 September, fire authorities changed the fire status to 'emergency warning' within the Lamington National Park area. Senior Binna Burra staff made the decision to evacuate the lodge, including all guest and staff. Staff were well trained and positioned in strategic locations to ensure all guests were safely evacuated. On 7 September, the bushfire destroyed most of the heritage buildings at Binna Burra; a handful of partially damaged buildings remained.

On 7th September, helicopter vision from media coverage showed the extent of the damage to Binna Burra Lodge. This recorded view was posted by Binna Burra Lodge's dedicated media spokesperson to Facebook. The post went viral throughout communities around Australia; it received 980,000 reactions, over 5,000 comments and 3,500 shares. The publicity generated national and international attention to Binna Burra Lodge and the bushfires. Stories were reported via major newspaper and radio stations from Australia to North America, Asia, Middle East, and Europe.

With the newfound publicity, Binna Burra Lodge quickly harnessed their ICT systems and converted their website into a "Bring Back Binna Burra" message, with updates on recovery efforts, trading through an online shop with supporter merchandise, and a Go-Fund-Me page for donations. "Friends of Binna Burra Lodge" Go-Fund-Me campaign raised over AUD $118,000 from public donations, many expressing their emotional connection to the rebuilding and reopening of the lodge.

Binna Burra Lodge is one of few showcased tourism businesses that used their ICT and disaster risk management plan, recovery phase, into action post-disaster to bring in the community and build it back better. Pre-determining a single media spokesperson that is experienced with media relations and has a connection not only to the business but the local community, is vital to maintaining consistency, clarity and control over media and stakeholder communications. Proactive media usage that showcases plans and progress engage the community, maintain relevancy, can provide reliefs and benefits through networking and collaboration opportunities, as well as maintaining a cliental base for when the destination reopens.

Binna Burra Lodge has successfully re-opened in September 2020, one year post bushfires.

Brunei Darussalam

Leadership and crisis communication during COVID-19: The case of Brunei Darussalam (2021)

The paper shows how leadership, effective crisis communication together with advances in telecommunication technologies, existing institutional practices, and a supportive government have helped Brunei Darussalam curb the spread of the virus within Brunei.

Resilience of Bruneian economy amidst COVID-19 based on the United Nations Disaster Risk Reduction framework (2021)

The study measures the economic impacts of COVID-19 in Brunei by estimating the exposure, vulnerability, and resilience of the economy. This study deployed the *United Nations Disaster Risk Reduction framework* (UNDRR) to examine the economic impact empirically.
The findings show the COVID-19 outbreak exposed the weaknesses in the energy sector. Additionally, analysis discloses the energy and tourism sectors are particularly vulnerable to the shocks of COVID-19. During the peak of the pandemic outbreak, unemployment in Brunei escalated. Additionally, the energy and tourism sectors are least resilient to pandemic shocks.

Addressing barriers to the integration of Brunei Darussalam's business services sectors into global value chains (2019)

Despite significant planning, however, Brunei's economy remains heavily centered on oil and gas and dominated by a large pool of MSMEs. These smaller firms continue to underperform, with limited contributions to overall economic growth and fewer connections to global value chains than other economies.

The report highlights multiple challenges in both sectors. Brunei is neither efficient nor effective in delivering logistics or financial services to its own companies and cannot currently compete with regional players in delivering such services more broadly.

Operational risk management: base ii/iii compliance (2017)

This training course gives businesses the knowledge and skills required to review, benchmark, and refine operational risk policies within financial institutions.

A systematic study of disaster risk in Brunei Darussalam and options for vulnerability-based disaster risk reduction (2017)

This systematic study of disaster risk and disaster management efforts in Brunei Darussalam uncovers reasons floods and landslides inflict significant social, economic, and psychological toll.

The research indicates that hazard risk in Brunei is high due to impacts of climate change. Limited reporting of localized disasters to international databases however fuels the misperception of low disaster risk in Brunei.

Community vulnerability is also high, as is disaster risk, due to limited knowledge, awareness, and motivation among the general population. The lack of understanding across the population means there is a lack of preparedness and prevention even to recurrent hazardous events. Partial incorporation of disaster risk reduction into governance structures and development plans contributes to heightened disaster risks.

Energy white paper – energy department (2013)

This *Energy White Paper* sets out a framework for action to enable Brunei Darussalam to address challenges and to manage the projected risks. The Framework involves the commitment of the Ministries of the Government of His Majesty the Sultan and Yang Di-Pertuan of Negara Brunei Darussalam, and the partnership with Brunei based and international investors to plan and execute important initiatives to achieve and fulfil *Wawasan Brunei 2035* (Brunei National Vision 2035). The energy sector is considered a core driver of Brunei Darussalam's economy, which forms part of the strategies to achieve *Wawasan Brunei 2035*.

Canada

Emergency management strategy for Canada: toward a resilient 2030

Hurricanes, floods, fires, telecommunication outages and rail disasters are just a few of the 195 disasters that impacted Canada between 2008-2018. Given the increasing frequency and severity of disasters, the strategy is designed to build on the *Sendai Framework* to strengthen the resilience of the Canadian society by 2030. To achieve this, a whole-of-society collaboration and governance is required, an improved understanding of disaster risk in all sectors of society is needed, an increased focus on whole-of-society prevention and mitigation activities, enhanced disaster response to enhance capabilities and strengthening of recovery effort by building back better to minimize future impacts.

8 Steps for planning your emergency and disaster plan

The Canadian Government provides business strategy and planning support with practical support materials including disaster management planning materials. Checklists and templates include preparedness, staff requirements, identification of risks, preparation checklist, emergency response team and revise, test and updating of plan.

Risk management – Fujitsu

Through its global activities in the ICT industry, the Fujitsu Group continuously seeks to increase its corporate value, and to contribute to its customers, local communities, and all stakeholders. Properly assessing and dealing with the risks that threaten the achievement of the company objectives, taking steps to prevent the occurrence of these risk events; establishing measures to minimize the impact of such events if they do occur, and to prevent their reoccurrence are assigned a high priority by management. Moreover, Fujitsu has built a risk management and compliance system for the entire Group and is committed to its continuous implementation and improvement.

PreparedBC: guide for tourism operators

Guide for Tourism Operators is a resource developed in partnership between PreparedBC and the Tourism Industry Association of BC, along with the BC Hotel Association, Tourism Tofino, Destination British Columbia and the Cariboo Chilcotin Coast Tourism Association.

The toolkit offers tourism operators guidance on how to prepare for crisis events enabling them to respond effectively, recover quickly and keep guests safe.

Digitalization in times of COVID-19

The impacts of COVID-19 have forced tourism, among other sectors, to quickly evolve its digital footprint. Data shows the past year has sped digital transformation by 5 years. The greatest opportunity in tourism is to build backmore sustainably. The greatest opportunity is to do so through digitalization and the use of smart data.

Business risk management programs (2018)

Business risk management programs are the tools that provide agricultural producers with protection against income and production losses, helping them manage risks that threaten the viability of their farms.

After a disaster happens, there are choices which can either reinforce the current state of existing typical system patterns, or address root causes of vulnerability.

Chile

Partnering for disaster preparedness in Chile (2019)

IBM and Johnson and Johnson partnered and deployed 15 employees - nine employees from IBM and six from Johnson & Johnson - together representing 10 economies, to Santiago to leverage their core capabilities in IT and healthcare to support four organizations focused on creating a more resilient Chile. This has been practiced through projects such as harnessing drone technology to build greater awareness of disaster risk.

Developing a disaster risk management index for Latin American countries (2018)

This work presents a risk disaster management index to measure how government institutions are dealing with disasters beyond legal and normative regulations advancing toward enforcement and implementation. With the complexity of the disaster risk management concept and its scope in mind, the analytic hierarchy process methodology was used to create a comprehensive index capable of measuring disaster risk management at Latin American and subnational levels. The index was checked for six Latin-American economies: Mexico, Nicaragua, Honduras, Colombia, Argentina, and Chile, obtaining representative results**.**

Evaluating risk of small business expansion into Latin America: A study in Colombia, Chile, and Peru (2016)

This report provides analysis of the business and risk environments of three Latin American economies and will benefit the South Carolina Small Business Development Center – an organization committed to providing MSMEs tools and assistance towards entrepreneurial growth and success. Part of their mission is to help small firms that are interested in expanding internationally. These firms will use this as a resource for preliminary analysis of the Colombian, Chilean, and Peruvian markets, as well as a basis for their product-specific market research, to then engage in these Latin American markets successfully.

Business education and creation of awareness for disaster risk management in Chile (2016)

This paper discusses a disconnect between disaster risk management research and tools for business continuity after disastrous events in Chile. As disasters are a common occurrence, local (large sized) firms are aware of the need for having tools for preparedness and mitigation of negative effects of disasters.

The paper illustrates the gap between local firms and their need to integrate business continuity management into their business operations and the decision making to cope with disaster risks. There is a need for innovative academic offerings in Chile to link disaster risk management and business education at the University of Chile. This program is developed in the medium-term for each of its components, starting with undergraduate students and achieving major actions with government and private stakeholders in a progressive ladder of initiatives.

Chile boost for business resilience (2016)
Businesses in Chile have come together to form the latest chapter of United Nations International Strategy Disaster Reduction's (UNISDR) Private Sector Alliance for Disaster Resilient Societies.

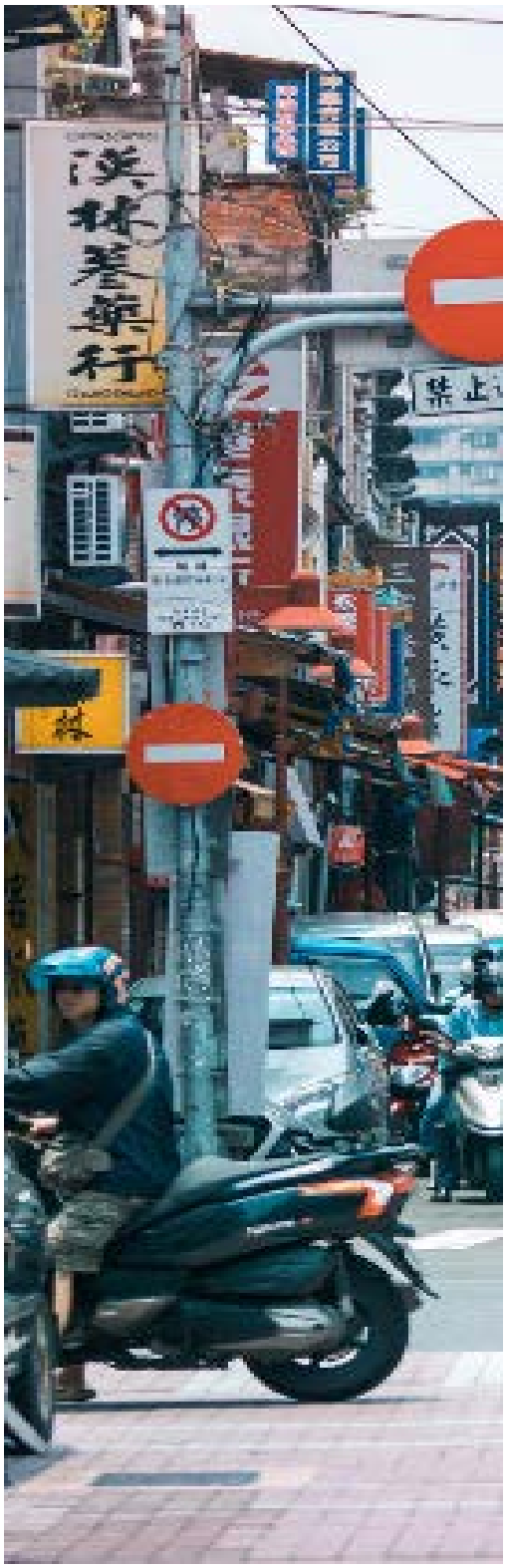
The Crisis Management and Organizational Resilience Service, or SeCRO, an initiative promoted by Fundación Telefónica, Transbank, Aguas Andinas and five other companies that are leaders in corporate responsibility and sustainability, is at the helm of the Chilean chapter.

Household risk management and social protection in Chile (2005)

The project demonstrates the institutions Chile has in place to help household's lower losses from shocks - from the unemployment insurance system, retirement security and the mixed health insurance system - are generally appropriately designed to match the nature of the risks intended to cover. Yet too many Chilean households do not have access to the sophisticated, state-of-the-art social protection institutions in place.

Chinese Taipei

Chinese Taipei's disaster preparedness and response: strengths, shortfalls, and paths to improvement (2020)[12]



Floods, typhoons and earthquakes alongside health-disasters and human-caused disasters; including plane crashes, industrial accidents, and nuclear power plant incidents, are identified as the greatest risks to Chinese Taipei. In addition, the region is also vulnerable to terrorist attacks and cyberattacks.

As a well-developed region, Chinese Taipei has sufficient resources to respond to large disasters and has dedicated emergency responders to ensure that disasters are managed with diligence. However, effective use of resource is of primary concern when reflecting on disaster preparedness. Challenges include staff preparedness, communication, coordination, and inter-departmental coordination are not where they should be for response.

In terms of preparedness, gaps include an unrealistic Chinese Taipei wide approach, a lack of systematic response, drills that fail to test the system in any meaningful way, a lack of education training and guidance for the broader community; and networks and a failure to extend the disaster response planning beyond the fire service.

There is significant opportunity to work with key industry partners, including tourism, to roll out disaster preparedness systems beyond the traditional fire services. Failure to address community preparedness and business preparedness leaves significant vulnerabilities and places unnecessary burden on the Government. Disaster resilience is everyone's business.

Natural disaster impact on business and communities in Chinese Taipei (2012)

There were unprecedented and complicated impacts of large-scale disasters on the community due to continuously developing situations. Engineering systems failed to meet required demands.

Reviews indicate the need for scenario planning and drills to build capacity among key stakeholders across community. More information and systems are required to support knowledge building and skill development.

In relation to slow build climate risks, mapping is required to understand vulnerability and build responses that are a genuine representation of the risks that are faced by the region.

Indonesia

Disaster risk reduction in Indonesia (2020)

This report serves as a reference document for the implementation and monitoring of the *Sendai Framework*. The findings, interpretations, and conclusions expressed in this document are those of the author(s) and do not necessarily represent those of the United Nations, including UNDRR, or its Member States. The presentation of the material in this report concerning the legal status of any economy or territory or of its authorities or concerning the delimitations of its frontiers or boundaries, as well as the text and the tables, is intended solely for statistical or analytical convenience and do not necessarily express a judgment about the stage reached by a particular economy or area in the development process. While every effort has been made to ensure the accuracy of the information, the document remains open for any corrections in facts, figures, and visuals.

Earnings management, business strategy, and bankruptcy risk: evidence from Indonesia (2020)

The purpose of this study is to examine the effect of accrual earnings management and business strategy to bankruptcy risk. Multiple regression analysis is performed on financial data of 1,068 non-financial firms listed on the Indonesia Stock Exchange. The result indicates that there is no relationship between earnings management and bankruptcy risk, while firms that implement either one of two generic business strategies of cost leadership or differentiation, significantly mitigate the risk of bankruptcy. The effect of earnings management to bankruptcy risk is essential for external stakeholders, such as investors and creditors, to assess bankruptcy risk, financial capability, and credit worthiness of a firm; while business strategy effect on bankruptcy risk benefits internal stakeholders, such as managers, in formulating strategies to deal with ongoing concern issues.

Crisis in Bali: lessons learnt in tourism recovery (2004)

Bombings in Bali in 2002 caused massive structural damage, human devastation, and significant reputational damage. Bali was plunged into crisis.

On reflection, it was determined that the region had failed to establish an adequate level of crisis planning and that relevant stakeholders had little confidence in dealing with complex situations.

In total, 202 lives were lost in this incident and hundreds more were injured. Distressed tourists left the island and hotel occupancy was left at single digit rates.

For tourism organizations, recovering the reputation of the region was critical. PATA was deployed to support recovery efforts and build community resilience. In building back better, it was important that the crisis was used as a catalyst to implement a more sustainable approach to recovery strategies and tourist developments.

Post-disaster, the evaluation indicates that reactive communication, safety, marketing, and community recovery strategies could have benefitted from foresight, planning and a more comprehensive, proactive and unified approach to tourism management.

Japan

Learning from mega-disasters: a decade of lessons from the great East Japan earthquake (2021)

Among the numerous lessons learned over the past decade of Great East Japan Earthquake (GEJE) reconstruction and analysis, we highlight three common themes that have emerged repeatedly through the examples of good practices gathered across various sectors.

- First is the importance of planning. Even though disasters will always be unexpected, if not unprecedented, planning for disasters has benefits both before and after they occur.
- Second is that resilience is strengthened when it is shared. After a decade since the GEJE, to strengthen the resilience of infrastructure, preparedness, and finance for the next disaster throughout Japanese and local governments, infrastructure developers and operators, businesses and industries, communities and households are building back better systems by prearranging mechanisms for risk reduction, response and continuity through collaboration and mutual support.
- Third is that resilience is an iterative process. Many adaptations were made to the policy and regulatory frameworks after the GEJE. Many past disasters show that resilience is an interactive process that needs to be adjusted and sustained over time, especially before a disaster strikes.

As the world is increasingly tested to respond and rebuild from unexpected impacts of extreme weather events and the COVID-19 pandemic, we highlight some of these efforts that may have relevance for economies around the world seeking to improve their preparedness for disaster events.

An overseas business paradox: Are Japanese general contractors risk takers? (2020)

Japanese industries have struggled with stagnation after the collapse of the bubble economy in the 1990s. Such a financial crisis has led to overseas business expansion of Japanese industries. This study empirically examines Japanese general contractors' overseas operations over the post-bubble period in relation to their financial status. The result shows that general contractors facing financial distress expand overseas business aggressively when the Japanese market shrinks. This result is opposite to conventional wisdom that stronger entities expand their territories of operations, thus "overseas business paradox." However, it can be considered a new scenario of industries' evolution when the economy matures.

Information and communication technology for disaster risk management in Japan (2019)

Breakthroughs in ICT increasingly offer new tools to support disaster risk management. Due to the rapid advancement of computing and communication devices, ICT's capacity to improve the disaster risk management framework became a critical factor to strengthen resilience. As an economy with high levels of disaster risk and technological development, Japan has developed several forward-looking ICT for disaster risk management. This report highlights the application of ICT for disaster risk management in two specific areas: Early Warning System and Disaster Information Management System. The analysis of eight Japanese case studies of ICT solutions for disaster risk management across various sectors, hazards, and levels of governance gives insight into their development, selection process and enabling environments, and provides case-specific lessons and recommendations. This report is intended as a reference tool for global disaster risk management practitioners seeking to develop an enabling environment for applying ICT solutions towards resilience. The lessons learned from the Japanese case studies are intended to support practitioners and decision-makers in other economies to envision and explore ways to better leverage ICT to strengthen resilience. While valuable information can be extracted from the analysis, each case is contextualized within its particular social, political, and environmental framework; our recommendations should be adapted to local needs and capacities.

Business risk disclosure and firm risk: evidence from Japan (2018)

The introduction phase of business risk disclosure in Japan is used as a natural experiment to examine the causal effects of the disclosure on firm risk. In contrast to risk factor disclosure that appeared partly in the Management Discussion and Analysis section in the United States, Japanese business risk disclosure is a new, independent disclosure regime, which began in 2004. Findings indicate the introduction of mandatory business risk disclosure has a negative impact on total risk. This suggests that an increase in business risk disclosure contributes to reduce a firm's cost of capital, which is contrary to the results found in previous research. However, there is a positive relationship across firms and years after the inception between the amount of business risk disclosure and total risk, indicating mandatory business risk disclosure has an impact on increasing investors' assessment of firm risk. Although the two effects offset each other, the effects of enhanced disclosure of business risks on reducing the cost of capital exceed the effects on increasing investors' assessment of firm risk.

Project managers for risk management: case for Japan (2012)

The purpose of this paper is to examine complex risk management practices of Japanese firms in a turbulent environment. This research examined risk management practices based on product accidents in Japanese firms. It examines how firms utilize risk management to respond to various types of risks related to product planning and process designs and how the firms with risk management respond to similar incidents. This focused group research uses surveys and additional interviews.

The research findings suggest most firms define the scope of product risk management in terms of product quality management, project management, and project management or quality management; firms that have risk managers include the entire supply chain in the scope of risk management; and firms re-examine the systematic risk management processes through actual major accidents (direct learning) or other firms' risk outcomes (indirect learning).

Guide to disaster management measures (technologies, know-how, infrastructure, institutions etc.) in Japan

This guide describes experience and knowledge of Japan according to the process of disaster management, including preparedness, response, recovery, and reconstruction, focusing on necessary actions for disaster risk reduction and possible technologies that Japan could provide. The guide can be utilized to support businesses in enhancing disaster management practices.

Disaster risk sense in Japan and gaming approach to risk communication (2007)

The aim of the paper was to identify and describe the three different modes of risk sense that occurred before the Japanese society accepted the unfamiliar and imported concept of “risk” (or its Japanese translation “risuku”) in the context of natural disaster reduction. These modes were: mode zero, in which the concept of risk was almost absent before the mid-1990s; the first mode, which occurred after the 1990s when the concept of risk became rapidly and widely accepted by linking it with the pre-existing concept of “danger”, or “kiken” in Japanese; the second mode, in which, some people highlighted active and participatory risk management processes based on the significant distinction between risk and danger proposed by Luhmann (1991a). Today, another mode of risk sense is needed to move beyond the limitations of the first and second modes, and to deal with the recurrence of natural disasters we are bound to see in Japan. To deal with such disasters, a novel and promising gaming approach is proposed that entails a new, third mode conceptualization of risk.

Case Study: Virtual Reality & Flood Preparation in Japan

Whilst not directly related to the tourism industry, the Japanese Government identified a clear gap in community preparedness to respond to disaster events and found a low-cost technology solution to address this.

During the 2011 earthquake which caused major floods and a tsunami, over 300 school children lost their lives because of a lack of preparedness and a lack of understanding of the importance of a rapid evacuation process.

After such tragic events, augmented and virtual reality training was developed to support community and school preparedness to ensure that senseless loss of life never happened again.

The program:
The program known as Disaster Scope, is a low-cost virtual reality (VR) or augmented reality (AR)programming developed by Dr Tomoki Itamiya. Utilizing a low-cost paper viewer, the program super-imposes a flood, fire, or debris situation over the scene where the participant is currently located. The program is designed to raised awareness of the dangers associated with a crisis event and is to be used in partnership with evacuation drills to support participants in building an understanding of how to respond swiftly when a disaster does occur.

Each training simulation takes 3 minutes to run through meaning that up to 500 students can participate in the training per day.

"This is the only application of its kind in the world. We utilized this system in evacuation drills organized by elementary schools and municipalities. As a result of the survey and verification, it is very useful for improving crisis awareness of students and citizens" - Dr Itamiya.

Program delivery:

- Currently delivered to students aged 8 and over.
- Used by adults as well to support crisis preparedness among community members and citizens.
- Challenges with use under 8 years old as the perception of fun and reality is blurred with the use of AR and VR.
- The use of the VR has a high level of impact on participants, with feedback from students indicating that over 50% feared the scenario that they went through.
- The program was able to directly respond to real world needs and the challenges faced by the community in the response to actual disasters.
- The power lies in the simplicity of the program and the alignment between the use of technology and the link to real world drills to support crisis preparedness.

Malaysia

Business practices to minimize safety risks: a case study of two adventure tourism: businesses in Malaysia (2020)

Risk is inherent in adventure tourism. Without risk, adventure tourism will lose their excitement and uniqueness. Managing risk in commercial adventure tourism operation is essential for the safety of travelers. The improper risk management in this business may lead to some issues such as injury and accidents. Risks involved in adventure tourism are frequently highlighted by the media, usually after a reported accident of fatality. The increase in the number of reported accidents by media in the adventure tourism sector recently may give significant effect and harmful impact on business, as well as to the whole tourism industry. Thus, it is important for the commercial adventure tourism businesses and company providers to have effective tools and model(s) in managing the risk effectively to avoid any circumstances that lead to accidents for the business to run smoothly with high reputation and confidence of customers.

This study explores whether Malaysian adventure tourism businesses adhere to any risk management guidelines or models. Two preliminary case studies of adventure tourism businesses in Malaysia illustrated that these businesses have no specific guidelines and risk management models that adventure tourism businesses should adhere to. In addition, findings from this study also demonstrated that there was no specific regulation imposed by the government for adventure tourism businesses to comply with. This study advises on the application and implementation of the *Event Management Body of Knowledge* model as part of Malaysian adventure tourism businesses risk management responsibilities.

Disaster risk reduction in Malaysia: status report 2020

The *Disaster Risk Reduction Status Report* provides a snapshot of the state of disaster risk reduction in Malaysia under the four priorities of the *Sendai Framework* for *Disaster Risk Reduction 2015-2030*. It also highlights progress and challenges associated with ensuring coherence among the key global frameworks at the Malaysian level; and makes recommendations for strengthening overall disaster risk management governance by government institutions and stakeholders at Malaysian and local levels.

Enterprise risk management practices among Malaysian firms (2014)

Enterprise Risk Management (ERM) is fast becoming a fundamental concern in all industries. ERM is a holistic approach for managers to identify risks and select appropriate responses in line with enterprise's risk appetite. This study aimed to identify the level of ERM implementation among firms in different industries in Malaysia. Data was gathered from 199 firms listed on the Malaysian Bursa through a questionnaire survey. The analysis shows that ERM implementation varies across different industries and that having an ERM framework in place is more common among firms in the infrastructure, hotel, and technology sectors.

An examination of enterprise risk management (ERM) practices among the government-linked companies (GLCs) in Malaysia (2011)

ERM is a new concept of managing risks holistically and in Malaysia, such a concept is still relatively new among Malaysian companies. On a positive note, however, the ERM concept appear to be receiving much attention over the recent years from various businesses and industries in Malaysia. This study aims to determine the level of ERM adoption among the Government-Linked Companies and to examine the influence of Chief Risk Officers and Board of Directors on the ERM implementation itself. Findings of the study showed that the more established Government-Linked Companies were, the more receptive to the adoption of ERM as compared to the less established ones. Also, companies that adopt ERM were found to have appointed the Chief Risk Officers. In addition, the quality of Board of Directors was also found to play a significant role in respect of ERM implementation.

Mexico

The risk reduction benefits of the Mesoamerican Reef in Mexico (2019)

The study explores the natural protection of coral reefs and dunes for residents. Findings indicate that dunes offer larger protection than reefs for storms, however reefs offer larger annual risk reduction benefits. The results also point out that both natural systems offer interconnected benefits that create resilience for destinations.

Given the role that reefs can play as a first line of defense for costal hazards, they should be better managed for such benefits. Risk financing and insurance are both critical in absorbing the losses in wake of disasters, but natural systems are not financed. There is a growing need for policy and government intervention for the protection, conservation and restoration of natural habitats that provide costal protection against natural disasters.

Mexico must invest more in disaster risk prevention to support sustainable development (2013)

The report explores the requirement for Mexico to do more to reduce future disasters; by accelerating the focus on prevention with levels of emergency response shifting the emphasis toward integrated risk management and reducing future disaster losses. Mexico is considered a vulnerable, improper land use, where territorial and urban planning contribute heavily to the vulnerability of Mexico's population and economy.

Strengthening disaster risk management in Mexico (2013)

A combination of population growth, concentration of physical assets, unplanned and unregulated land-use and changing climatic conditions has led to Mexico’s increasing vulnerability.

The World Bank supported the Government of Mexico to disseminate knowledge and experiences from its federal government through state and local governments most impacted by disaster. Furthermore, the program supported the promotion of mainstreaming disaster risk management into land use and urban planning to assist in prevention and building back better.

Closing the gap: Comprehensive disaster risk management in Mexico (2011)

Having been hit by more than seven major catastrophes since 1985, economic damages to Mexico have reached over USD $22 billion. Consequently, the federal government has been innovative in response to disaster risk management.

Papua New Guinea

Papua New Guinea crisis response plan (2021)

Papua New Guinea (PNG) will work to prevent or reduce displacement and strengthen resilience in communities. The focus of this project is disaster prevention, working to train the trainers, strengthening capacity among community leaders to host community-based training sessions and experiential learning on disaster risk management, and to support and implement community planning project to mitigate risk.

Disaster risk reduction in Papua New Guinea (2019)

The status update report highlights that PNG continues to be affected by limited resources and capacity to operate. Disaster risk is exacerbated by climate induced factors and there continues to be a need to invest in disaster resilient infrastructure. Challenges still exist for the region including a lack of connectivity, remoteness and inadequate resources (funds and human resources).

The challenges of doing business in Papua New Guinea (2012)

Despite improvements since 2002, doing business in PNG remains a challenge due to political uncertainty, crime, and security issues, and the effectiveness of policies, services, and government regulations.

The report recommends ensuring access to key agencies including the police, correctional services, and judiciary and in efforts to tackle corruption reform in government procurement needs to take place. Furthermore, there is a need to review business regulations and land-leasing to enable business operations.

Papua New Guinea's strategic program for climate resilience (2012)

The program is designed to create transformational change ensuring that investment in PNG's development is climate resilient. This is to be achieved through improved access to resources, knowledge, and tools alongside climate resilient infrastructure development by government and private partners across PNG as well as at sectoral, district and community levels. It is understood that there is a direct link between the resilience of community and the overall poverty reduction – in that building climate resilience will increase food security, promote social development, and reduce overall poverty levels.

Current barriers to achieving the 2050 vision for a more resilient PNG include inadequate human resources and levels of knowledge of climate change risk management, a lack of knowledge and tools to reduce risk associated with climate change and poorly designed infrastructure which is susceptible to climate impacts.

To overcome the barriers, the program established a pool of trained and qualified specialists in climate risk management to transition communities. These specialists were prioritized to vulnerable communities. A Climate Change Trust Fund was established to support priority adaptation projects for farmers, fisherfolk and vulnerable communities. Finally, efforts were made to boost critical infrastructure to reduce its vulnerability and make it more resilient to climate risk, similar efforts were made on remote islands.

Papua New Guinea investment in disaster risk management (2011)

Over 310 disaster events have impacted PNG in the past 60 years including earthquakes, tsunamis, floods, and volcanic activities. The cost of the disaster to the region was equal to 4% of GDP.

The *Papua New Guinea Investment in Disaster Risk* Management plan makes suggestions to improve risk management strategies in response to increase threats including the need to establish a good level of baseline data to facilitate post disaster assessments; to improve the reporting process to increase transparency in expenditure; and to introduce budget for risk assessment. Furthermore, the Plan identifies the need to update the *Papua New Guinea and Provincial Disaster Risk Management Handbook*, increase funding to support risk management practices and reduce the levels of vulnerable property through building codes and insurance levels.

People's Republic of China

Learning from Experience: Insights from China's Progress in Disaster Risk Management (2020)

China has long experienced more than its fair share of disasters, including earthquakes, typhoons, floods, and droughts. The good news is that in recent decades, China has made tremendous headway in building its resilience to disasters. Learning from these efforts will be critical to strengthening resilience building efforts in China and beyond. In that spirit, this Knowledge Note distils some lessons from China's progress in many areas of disaster risk management.

The note does not comprehensively cover China's achievements but focuses instead on topics that might be of interest to destination risk management practitioners globally. Drawing on expert insights from China's disaster risk management community, key themes highlighted by this note include: the evolution of disaster risk reduction planning; the rise of demonstration communities; standardization of the disaster loss statistical system; development of an agricultural insurance system; and establishment of a catastrophe risk insurance system. China has also made significant progress in establishing a catastrophe risk insurance system that allows for local innovations and pilots based on local characteristics; development of a comprehensive space-based system of disasters and emergency monitoring. Amid a changing climate, China is facing the specter of even more significant disaster risks in the future, which may also bring cascading global impacts. Taking stock of the progress that has been achieved so far, there is good reason to believe that China will continue to learn and innovate toward a resilient future.

What risks are Chinese businesses worried about? (2019)

Chinese executives are most concerned with natural catastrophes, having suffered economic losses of over USD $44 billion and 979 fatalities in 2017 alone. In response, there is a focus on continual improvement in the resilience of infrastructure – especially in rural areas.

Despite an overwhelming concern for natural disasters, businesses in China are cautioned to take a broader, all-risk approach including considerations on how to become nimble and agile in response to potential unstable market conditions due to future economic uncertainties. They are also warned to build a multidimensional cybersecurity management system to prevents cyberattacks, including strengthening of employee training, communication and ensuring strong policies in place.

Peru

Peru strategy for reactivation of tourism 2021-2023

The strategy responds to tourism's need to react in a post-COVID-19 environment. Specifically, actions are required to diversify and expand tourism offerings, invest in tourism infrastructure, build capacity within tourism businesses, support handicrafts through training, product development and promotion incentives, tourism marking and promotion, the implementation of Safe Travels and the strengthening of partnerships between government and businesses across the industry.

The vision of the strategy is that: *"Peru is recognized as world level as tourist destination sustainable, competitive, quality and safe."*

Actions against each pillar support the rebuild of tourism post crisis.

***Community eco-tourism in rural Peru*: Resilience and adaptive capacities to the COVID-19 pandemic and climate change (2021)**

Community preparedness in Peru is both uneven and unbalanced. Whilst in some respects eco-tourism systems have been able to adapt to the challenges that COVID-19 has created, broader preparedness to climate response has not been effectively responded to. Further risk management strategies are required among businesses to prevent and prepare for the impact of changing climatic conditions. Eco-tourism businesses currently do not have the skills or capacity to deliver this.

Exploring crisis readiness in Peru

Research indicates that businesses yet to experience a crisis do not priorities crisis readiness. In these circumstances, the challenge is to change MSME's perceptions to support their understanding that crisis management techniques are indeed required.
Most MSME's are operating under the belief that "it won't happen to me", and therefore are unwilling to participate in crisis management planning.

The research paper indicates that further support and training is required for businesses to upskill and provide the tools required to ensure the knowledge of crisis management techniques. Failure to support businesses in understanding the importance of crisis management will lead to ongoing avoidance, rather than shifting towards engaging crisis management as a business-as-usual activity.

Disaster risk and management in Peru

Plan International works in Peru to ensure that children, young people communities and schools as well as government authorities understand and engage in disaster risk reduction, specifically with the mandate to protect children in emergencies.

Over 150 participants have been training to understand and reduce vulnerabilities, specific to regions. Communities, families, and caregivers are also trained in disaster risk management with a focus first on prevention and risk mitigation in homes and communities.

Peru: An Andean country with significant disaster and emergency management challenges[13]

Peru is challenged by increasing natural disasters. Peru has explored significant crisis preparedness, prevention, and management opportunities. This includes an approach to education among both adults and children, enhancing awareness and understanding of preparedness. Engaging youth is an important step to drive early levels of engagement and to promote broader community acceptance.

The prevention plan in Peru is strategic and long term in its nature, taking into consideration the objectives and programs designed to reduce risks, minimize damages, limit losses and protect people against natural phenomena or from man-made causes. These prevention strategies all emanate from Peruvian, sectorial, regional, provincial, and district levels (*SINADECI: Manual of Basic Knowledge for Civil Defense Committees and Civil Defense Offices*).

A core outcome of the program was focused on building the skills of the local community, enhancing knowledge to ensure that even the poorest of communities understand and can adequately respond to the risks they face.

The role of the affected state: A case study on the Peruvian earthquake response (2008)

The paper overviews the response to the 2007 earthquake that hit off the Peruvian coast. The earthquake saw a death toll of 600, with 1,000 injured and over 7,000 families impacted by the event.

Infrastructure, both governments invested and private, was significantly damaged from the initial shock and the following aftershocks. A state of emergency was declared, and the international community also offered support in the aftermath.

Due to a period of significant growth, the Peruvian Government was well positioned to respond to the emergency with resources allocated at scale through the central government.

13 Peru: An Andean Country with Significant Disaster and Emergency Management Challenges, FEMA, https://training.fema.gov/hiedu/downloads/compemmgmtbookproject/comparative%20em%20book%20-%20em%20in%20peru.pdf

The review post-earthquake identified some duplication of efforts where key organizations could have communicated more effectively in relief efforts to ensure needs assessments delivered optimal outcomes across impacted areas. The use of ICT can now support a more streamlined assessment of needs and deliver timely information.

Evaluation of efforts also noted that the response efforts ensured that the injured were evacuated promptly, and that there was no spread of disease. This was due to well-coordinated and rapid relief efforts.

Peru's disaster and prevention system is deemed one of the most advanced in the world. As part of the decentralization process the response falls on regional and local authorities depending on the level and scale of the disaster. Coordination and communication are critical across agencies at this stage to ensure that efforts are directed where they are most needed, and that duplication is not felt.

Interestingly, the evaluation identified a lack of preparedness at a local level due to a recent election cycle and new induction of Mayors. A clear process for building knowledge and ensuring crisis management, preparedness and response becomes a top priority for newly elected members should become a key political consideration. Leading from the top is important.

An integrated simulation of tsunami hazard and human evacuation in La Punta, Peru

In low lying coastal areas, tsunami evacuation processes are important – understanding how to respond to warning systems and where high ground to evacuate to is becomes critical.

By running computer-based simulations of tsunami events across different times and days, it was identified that at certain times, evacuation centers may be up to seven times their capacity, therefore highlighting a need for additional evacuation centers within the district. Furthermore, some of the existing shelters within the area failed to offer safety in tsunami events.

Using ICT, researchers can better understand the demands of communities in a disaster event in order to ensure infrastructure is in place to support response and recovery efforts. The tool provides a comprehensive understanding of evacuation systems and measures for improving performance before pressures negatively impact the systems when support is required in real life.

Disasters, development, and glacial lake control in twentieth century Peru (2008)

Glacier melting in Cordillera Blanca Mountain range has caused deadly lake outbursts, floods and glacier avalanches. Since the onset of such disasters in 1945, these hazards have been responded to in various ways, including by tourism groups.

Interestingly, economic development groups identified the value of disaster mitigation at glaciers as a way to modernize hydroelectricity and create distinct tourism propositions within the region.

Tourism has been an important part of the mountain ranges due to the natural landscapes. To mitigate the risk associated with the glaciers, lakes were drained and dammed – a solution deemed an over-reliance on science and technology to resolve vulnerability. However, the solution supported the outcome all populations needed – building community resilience.

Korea

Disaster risk management in the Republic of Korea (2018)

With the rapid growth of Korea, there has been an increase in the number and type of disasters that are impacting communities. This book explores the lessons learned from Korea's disaster risk management measures, policies, and responses, as well as some of the world's major disasters. It offers insight into the future of disaster risk management.

Seoul, Republic of Korea: disaster risk management profile (2016)

Natural disasters result in damages annually of USD $700 million, the region typically faces risks such as typhoons, floods, droughts, landslides, snowstorms, tsunami, and earthquakes.

The Korean Government commenced its disaster management improvement program in the late 1990s, responding to natural and man-made disasters. The program included disaster management information systems and flood insurance programs.

In 1995, the Ministry of Government Administration and Home Affairs implemented the *National Disaster Management System* project under the Cyber Korea 21st Century and the National Administration Reform 100 Projects. With a focus on the interconnection of safety management operations, this ICT system supports operations of 24 affiliated organizations and local autonomies to link safety management systems. The objectives of the project were to protect the lives and property of communities, improving quality of life through the prevention of disaster. The use of ICT facilitates quick response and recovery through scientific and systematic Korean national disaster management information systems.

To mitigate communication outages during disasters, throughout South Korea automatic voice warning facilities provide disaster status updates to communities by phone and town speakers were installed in 232 municipals with an investment of USD $8.6 million.

Reducing disaster risk in cities — the Republic of Korea's experience

The government of the Republic of Korea made disaster reduction a priority. Korea's commitment to risk reduction is growing across sectors and communities.

Community-based preparedness is a key approach to building resilience. Community-based preparedness is designed to provide knowledge and information about climate related impact directly into people's homes. The ancient custom of Phom-A-Si, or working in turn for one another and exchanging services, has been practiced since the Yi Dynasty (1392 to 1910). This approach is used as the bases for volunteer participation in disaster relief activities.

In addition, formalized Community Volunteer Disaster Prevention Teams have been established by the Korean government. The heads of these teams are trained by the Korean government, once trained the local government then assumes responsibility for educating the wider team, including in the appropriate response to seasonal forecasts and early warnings.

Disaster risk management and Korean Policies [MOOC – delivered through Coursera & Yonsei University], ongoing

The course outline states "*In the past, developing countries such as Korea lacked guidelines for exploring effective policies for disaster-resilient growth, resulting in unnecessary sacrifices in terms of time, resources, and human capital. Through the lessons learned by Korea, currently developing countries facing socio-economic development can build disaster resilience without sacrifices. Utilising Korea's sound practices and institutional reforms, this course provides a valuable roadmap to prevent and mitigate the catastrophic effects of disasters.*"

New Zealand

Visitor sector emergency advisory group

New Zealand has a high propensity to natural disasters including earthquakes, volcanic eruptions, and slow onsite disasters such as climate change and economic challenges. As such risk management is a critical part of the tourism industry.

The Visitor Sector Emergency Advisory Group is utilized to ensure that the needs of international visitors are considered in emergency planning scenarios. The group includes representation from the tourism industry, local government, central government, the education sector, and other groups that work directly with the tourism industry.

During an emergency, networks are activated to make sure that visitors receive timely and accurate information about the situation and what needs to be done. This ensures that visitors know where is safe to travel, thus protecting the reputation of New Zealand.
This is a very practical example of how to activate a tactical program to support preparedness, response and recovery that considers businesses and travelers within a destination.

Fast and slow resilience in the New Zealand tourism industry

Challenged by rapid and slow onset disasters (earthquakes, volcanoes, climate change) and political and economic challenges, New Zealand is no stranger to disaster response.
This research chapter explores two contrasting destinations and disaster resilience in each.

<u>Nature Based Approach – West Coast</u>
On New Zealand's west coast, communities were once reliant on timber milling, agriculture, and mining. Now they have a tourism focus. With a significant reliance on natural attractions, glacier tourism attracted over 500,000 visitors in 2015. As such, climate change is a major threat to the region. Other risks to the region include floods, landslides, and earthquakes.

In addition, the region is challenged by a large, young, transient workforce. Indicating they are often inexperienced in crisis response.

To effectively respond to crisis within the region, a strong relationship is required between businesses, Council, park management and police to ensure that all residents and the transient population are supported in recovery efforts.

Regular scenario planning, workshop and drill exercises are utilized to prepare communities for the risks they face and to ensure swift evacuations and responses to challenges.

Coordination, communication, and collaboration are identified as critical to ensuring the community manages its risks effectively.

<u>Christchurch</u>

In contrast to the rural west coast is the urban center of Christchurch, sitting on a fault line. Those in the central business district were most impacted by the 2015 earthquake. One year on, tourism businesses reported that they were satisfied with the level of preparedness that they felt and that they were better prepared to deal with future crisis. However, almost half of the businesses spoken to had not backed-up their data – this was a major issue identified post-earthquake as operators were unable to access data off-site in the aftermath of the crisis. Furthermore, few businesses have a crisis management plan; only 1 in 3 businesses had a formalized plan in place post crisis.

The research indicated the value of the community and businesses working collaboratively together post crisis. In addition, for those that were able to survive the crisis, it was identified that they became more adaptive and agile (both formally and informally). However, more work needs to be done within the tourism industry to support tourism operators to create formalized plans and structures to drive crisis preparedness to aid response and recovery processes.

MSME Business Support Guides (2004)

The following set of guides were developed by Resilient Organizations – a collaboration between research and industry – to provide a practical set of guidelines to support MSME's in crisis preparedness response and recovery.

Whilst a little dated, the guides still provide a strong guide to support businesses in the start of their preparedness journey at a basic level. Further, more detailed guides would be required once awareness is built, as the level of complexity is very low in these guides.

Chaos to teamwork

The focus of this guidebook is on how to prepare a leadership team before an event to ensure the team's effectiveness.

The guide is heavily focused on preparedness, identifying issues before the team is placed in a crisis situation to ensure that under pressure they work effectively together. The guide seeks to ensure diversity on the crisis management team to improve decision making and drive innovation and idea generation. The guide champions change to support creative thinking and innovation.

Shut Happens! Disruption and adversity are just harsh facts of life for business

This resource is a short guide to support businesses build resilience and survive a crisis.

The resource offers a combination of a short action list summary, detailed actions and supporting information to build resilience and provide businesses the steppingstones to start considering how to become more prepared and resilient.

The action summary checklist is created to provide a practical list of options for businesses to get back up and going once a disaster strike.

Whilst the resource proposes that it takes an all-business approach, it is most suited to MSME's, this toolkit is unclear as to whether it should be used for disaster preparedness or response.

Staffed or stuffed

This toolkit supports a people first approach to crisis management – a guide for organizations supporting their people during a crisis.

The toolkit covers all stages of the disaster management cycle: planning for people before disaster strikes, supporting your staff so they can support your business as your respond to the situation and rebuilding for a better future. All of which are underpinned by strong leadership and communication. Talking and listening to staff are critical steps in ensuring that businesses are most likely to survive through a disaster.

Striving through

This guide supports businesses through the immediate response, recovery and post-disaster adaption required to thrive.

Response considers the immediate actions required for the wellbeing of owners, staff and the community as well as the assessment of the situation and communication with key partners.

Recovery ensures taking stock of the changed environment and redeploying resources to get back to business.

Thriving is about adjusting to new ways of doing business and reallocating resources accordingly.

Cover your assets

The *Cover your Assets Guide* supports MSME's to select the right insurance policies and provide advice on how to prepare to use the policy and claim on the insurance.

Alpine Fault magnitude 8 – AF8 (New Zealand)

The Alpine Fault on New Zealand's South Island has a history of large earthquakes that have devastating impacts on the island.

AF8 is a partnership approach with six South Island Civil Defense Emergency Management (CDEM) groups. A complex and coordinated response is required to save lives in case of a severe earthquake.

The award-winning approach to crisis management includes scientific modelling, response planning and community engagement to increase destination's resilience. They explicitly include the tourism industry in their planning and foster industry preparedness.

Integrated partnership approach
The program is all about partnerships and collaborating across regional, South Island and New Zealand borders as well as among organizations and community to build resilience. The team includes scientists, emergency services, Lifeline (social support), health authorities and many other partner agencies while the program is managed by the Emergency Management Southland.

Science as the foundation for decisions
As the program commenced in 2016, partnership was determined as the foundation to success, with key scientists and scientific institutions to develop a credible scenario event to build their decisions on.

First, a working group developed most likely scenario events for the South Island and then explored the impact on a regional level.

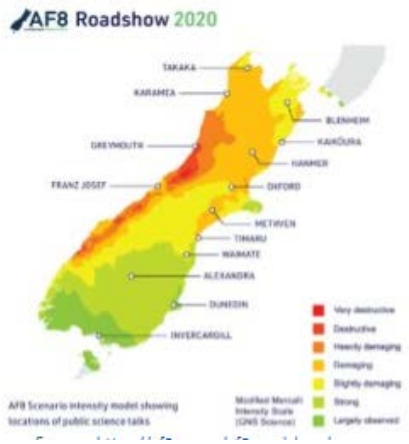
An expert panel modelled the regional impacts considering the geography, buildings, community, and history of each region. This information was then tested in a regional workshop with local emergency managers, community groups, utility providers and industry representatives to ensure that considerations were realistic. This led the practical implications for the regional response plans.

Island wide leadership while empowering every individual region
Given the complexity of the region and the likelihood of more earthquakes, it is a priority of the framework to increase awareness, enable conversation and build societal preparedness to natural hazard events in every community. Every region and their community prepare for crisis and build resilience within their own networks and feeding into the existing networks.

Part of the program are regular AF8 roadshows to educate the communities and provide direct access to science and impact information relevant to their specific region.

Inclusion of Tourism

AF8 explicitly includes the tourism industry in planning and foster industry preparedness. Careful planning is needed as some of the most popular tourism destinations are most at risk. Tourism industry representatives are involved in regional workshops and working groups to ensure transient populations are considered. For instance, the tourism forum brought together more than 100 delegates including DMOs, tourism operators, CDEM groups, emergency services, government agencies and scientists to discuss how to best prepare the tourism industry and to identify pressure points. When considering the different regions on the South Island they identify tourism hotspots, estimate visitation numbers to be able to develop evacuation plans that include the high number of additional people.



Drills and pressure testing

Regular pressure tests are used to ensure speed and efficiency in response and to test information and equipment sharing.

Implications

A strong scientific foundation fosters credibility and is essential to understand what crisis and crisis impact is likely to happen, and how best to prepare and respond to it. Actively integrating the tourism industry in crisis management planning ensures that the tourism industry can play an effective role in response and recovery.

Philippines

Measuring small island disaster resilience towards sustainable coastal and fisheries tourism: the case of Guimaras, Philippines (2021)

The *Philippine Disaster Risk Reduction and Management Act of 2010* (or Republic Act 10121 2010) mandates that each level of government from the Philippines government down to the village levels should constitute a Disaster Risk Reduction and Management Council, which are decreed as the disaster first responders. The Disaster Risk Reduction and Management Council should be headed by the Governor and the Mayor at the provincial and municipal levels, respectively, and be composed of 17 heads or representatives of the following offices:

1) Planning and Development;
2) Local Disaster Risk Reduction and Management Office;
3) Social Welfare and Development;
4) Health;
5) Agriculture;
6) Gender and Development;
7) Local Engineering;
8) Local Veterinary;
9) Budget;
10) Division Head/Superintendent of Schools of the Department of Education;
11) Armed Forces of the Philippines assigned in the area;
12) Philippine National Police;
13) Fire Marshall of the Bureau of Fire Protection;
14) Association of Barangay Captains;
15) Philippine National Red Cross;
16) Four accredited Civil Society Organizations; and
17) A private sector representative.

Despite tourism's significant importance in the Philippine economy, there is no specific role within the Council. The research indicates that whilst the Disaster Risk Reduction and Management Councils have a clear understanding of the risks that impact communities, there is little effort to disseminate information to the broader community. Therefore, there is limited awareness of risk and limited ability to prepare.

Transient populations have been included in planning by the Disaster Risk Reduction and Management Council's and consideration given to the evacuation of vulnerable populations made. Again, further dissemination of messaging could be provided to communities to ensure consistency of messaging.

Finally, the research indicated that those communities that had been worst hit by natural disasters in the past were considered the most resilient and the most prepared for future disasters. Recommendations highlight the need for regular information, communication and knowledge sharing sessions within the community to support resilience and preparedness across communities – especially among the most vulnerable small island communities.

Australia and the Philippines strengthen partnership on disaster risk management (2019)

The Australian Government, through the Australian Aid program, will work closely with the Philippines National Disaster Risk Reduction and Management Council , and technical agencies, such as the Philippine Atmospheric Geophysical and Astronomical Services Administration, the Philippine Institute of Volcanology and Seismology, the Philippines National Mapping and Resource Information Authority, and the Mines and Geosciences Bureau, to deliver enhanced disaster risk management and resilience projects.

The project is focused on generating digital information and maps for Metro Manila through a survey using state-of-the-art Light Detection and Ranging (LiDAR) technology.
LiDAR technology will enable the government to build a more accurate risk profile of Metro Manila. The technology models the impacts of disasters, human casualties, infrastructure, and crop losses. This will enable government and communities to better understand vulnerability to earthquakes, floods, and severe wind so that they can prepare and fund their disaster action plans.

From managing disasters to managing risks: key efforts in the Philippines (2016)

The report notes that for the Philippines, it is important to reduce disaster risks to complement preparedness efforts and to contribute towards the broader sustainable development of the region. Increasingly, the Government and core partners note the importance of addressing risk in supporting efforts to reduce poverty and alleviate issues associated with infrastructure and health, among others. The Philippines and the international community must focus on preparedness and place greater importance on disaster risk reduction.

Case Study: Hotel Resilient – Indonesia, Maldives, Myanmar, Thailand, and the Philippines

A partnership between UNISDR, PATA and Global Initiative on Disaster Risk Management (GIDRM), the *Hotel Resilient* program is designed to improve disaster risk management among hotels across tourism destinations, thereby strengthening their resilience. The approach takes a partnership perspective with government and private integration to provide knowledge, skills, support, and tools to reduce business risk, reduce the risk to tourists and workers, to build resilience among the surrounding community and to raise awareness of the social, natural, technological, and biological hazards that are prevalent across the regions and the industry.

The program:
Given the significance of tourism as an economic driver in the participating island economies, it is critical that stakeholders can recover effectively and build back stronger, whilst learning from the impact of multiple crises and disasters to better prepare industry and communities for future challenges.

Tourists are an especially vulnerable stakeholder group during a crisis as they are away from their usual residence and will often never have experienced the types of crises that will impact them. Consequences of a negative experience in destination not only impacts the immediate destination experience for tourists but can also lead to negative word of mouth, and on-going reputational damage. Understanding how to prepare for managing crisis not only internally with staff, but also externally with tourists, can reduce the damage associated with the impact and minimize the reputational damage for organizations and destinations.

In the Philippines, the response to natural disaster is said to be reflective of the local adaptability, spirit of bayanihan (community spirit), and damayan (helping each other). Understanding the value and contribution of local culture is critical to resilience and recovery.

Program delivery:

- The program included the development and delivery of a multi-hazard risk management handbook with standards, checklists, and tools to support tourism stakeholders in mitigating and managing associated risks.
- Weekly workshops were held with participating hotels to enhance knowledge, skills and understanding of risk management.
- Detailed action planning to support on-going implementation of risk management practices.

- Recovery action plans designed to expand income streams, explore supply chains, rebuild communities and livelihoods, and increase the resilience among tourism enterprises.

"Tourism is part of the recovery because it is the industry of hope. It is the industry that connects all of us," - Dr. Taleb Rifai, former UNWTO Secretary General

Outcomes:

- Preparing for a crisis management plan enables quickly tailored responses to different types of crises that prioritize staff and visitors.
- Through understanding the role different tourist markets play, action plans enable a focus on lucrative markets that are likely to return quickly.
- Collaborating with other providers across a supply chain can add value to visitors, reduce negative perceptions and create opportunities in recovery.

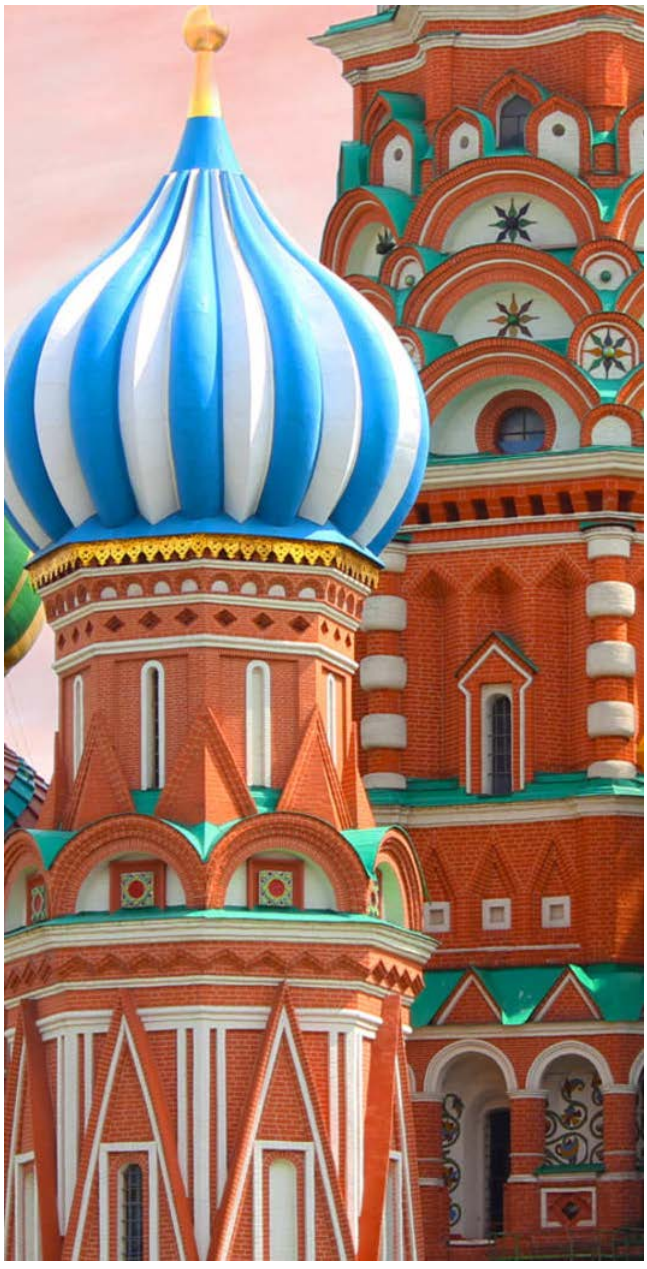
Russia

Security and crisis management Russia

With limited indication as to why, the report identifies that Russia is better equipped to deal with the impact of climate change and subsequent natural disasters than its neighbors.

The report explores the European Union (EU) and Germany's learnings when it comes to crisis management. It identifies the need to enhance capacity and knowledge among business owners to improve prevention and preparedness for early response to disaster and conflict.

Of note, monitoring and early warning needs to include indication of the specific state's fragility and political radicalization, tensions over resources and energy supplies, environmental and socio-economic stresses, threats to critical infrastructures and economic assets, border disputes, impact on human rights and potential migratory movements.



Greater collaboration and coordination between core stakeholders were also identified as a key focus area to drive enhanced crisis response.

Russian tourism enterprises' marketing innovations to meet the COVID-19 challenges (2021)

Exploring the resilience of tourism businesses in the face of a global pandemic indicates a broad level of resilience among the Russian tourism industry. The paper explores the way in which business was conducted in crisis conditions to identify ways to enable efficient responses to similar crises in the future, and to contribute to a more resilient tourism sector in the aftermath of the pandemic.

Findings indicate that businesses that independently worked through the pandemic (as opposed to seeking state support) were more innovative and able to pivot and adapt to new services, products, and customers in order to survive.

The value of digital marketing was identified for MSMEs as a way of reaching new markets and communicating market requirements such as travel security. Businesses were also able to explore localized visitation and stimulate local demand specifically using digital platforms.

Concept and procedures of crisis management in Russian hotel enterprises (2016)

This report focuses on economic crisis as opposed to natural crisis. Factors examined alongside external economic crises that may influence or trigger a crisis in the hotel industry include poor hotel management systems, inadequate customers' relationships, and revenue management.

The report identifies step by step identification of crisis triggers, and opportunities for hotel operators to mitigate the impacts before they become widescale crises for the organization.

Singapore

Organisational crises in the hotel sector: a perspective from Singapore (2008)

The study reports, positively, that all hotels participating in the study had a dedicated crisis management team within their hotel. Several prevention mechanisms (e.g., fire drills) are mandatory in Singapore, and therefore the hotel management team has in place the required systems and mechanisms to support a coordinated crisis response.

Communication is identified as a critical stage of the crisis management process, ensuring that staff and stakeholders are aware of and able to respond to business threats (internal and external). The research suggests regular training as an effective way of managing staff awareness and understanding of crisis management techniques.

The report was focused on luxury hotel groups limiting their replicability across the broader economy. However, it is important to note the broad understanding of crisis management and the network of champions within the destination.

Managing a health-related crisis: SARS in Singapore (2003)

During the SARs outbreak, the major role of Singapore Tourism Board was to inform visitors and travel trade of the work being done to combat the disease.

The staff utilized a range of ICT mechanisms to monitor all media and correct any misinformation being spread about the disease, ensuring only factual information was shared among key stakeholders. A weekly newsletter was also published with up-to-date information, relaying timely updates where required.

All 207 hotels across Singapore were required to temperature check visitors. To support individual organization's efforts, Singapore Tourism Board rewarded those doing the right thing with the "Gold Standard in SARs Prevention" label.

Post disaster, private and government enterprises worked closely to rebuild lost consumer confidence and ensure the rebuild of the tourism sector.

Thailand

Tourism crisis management framework: the Thai experience (2005)

Thailand has been no stranger to disasters. Recent impacts have come from SARS, Southern Thailand unrest, tsunami, and bird flu. All disasters have been swiftly responded to by the Thai Government.

Whilst each crisis required intervention, the level of intervention became dependent on the degree of uncertainty in the operating environment and the degree of complexity in the operating mission. As such, no two crisis responses should be the same.

Learnings from Thailand's response indicate that adaptability and flexibility are critical in crisis management. Furthermore, the paper identifies the importance of understanding the timings of the tourism season in relation to crisis response. Whilst the SARS epidemic occurred outside of the main tourism season; bird-flu was the height of the winter season. Additional complexities exist with the psychological reactions of visitors, in the unknown and the hysteria. Being away from one's own home, comfort and known during a crisis creates additional challenges. Managing these additional psychological needs of visitors is an important step in the crisis response. Timely and quality information dissemination is crucial for managing negative reactions such as fear and panic.

Tsunami recovery: a case study of Thailand's tourism (2006)

Research into the response of the Thai tsunami identified that visitors were not attracted to the region by discount packages post disaster. Rather it was the warm and welcoming attitude of locals and the natural beauty of the region that was reattracting visitors. In contrast, travelers who did not want to attend were concerned that another tsunami could impact their visit. In addition, the knowledge that so many people had died on those beaches made it hard for them to return. Interviews with Thai hoteliers suggested that the light-hearted packages for recovery were well meaning but badly timed, coming too long after the tsunami to save the tourism season and prevent resort closures and layoffs.

Crisis management of hotels in Phuket: compare and contrast between Thai and foreign styles (2005)

The report reiterated that SARS was the most damaging of crises for the Thai hotel industry with occupancy dropping as low as 22%. Other significant events such as bird flu and the bombings, whilst impacting the industry, were less significant.

Crisis response at each stage by hotels was different, indicating the importance of a flexible approach to crisis management. Employing recovery techniques such as sales promotions and special campaigns were critical in bringing back visitors.

After being impacted by several disasters, the industry identified that an over-reliance on a single market is not conducive to good business. As such, diversifying tourism businesses into broader markets should be considered.

However, the report also identifies hotels fail to have crisis management plans in place despite the number of crises they are impacted by. They lack the maturity to have a planned prevention, response and recovery mechanism identified in more mature markets. Management of a crisis tends to be reactive and ad-hoc as opposed to purposeful and coordinated. Additional work needs to be done to up-skill and support stakeholders to deliver a coordinated and purposeful approach to crisis management.

Communication was also a critical lesson learnt. One source of truth was required for staff and guests to ensure consistent messaging to all.

Overall, the study indicated that there is a lack of readiness for future events and more work needs to be done to support tourism stakeholders.

Phuket: tsunami and tourism - a preliminary investigation (2007)

The study explores the 2004 tsunami in southern Thailand and its impact on the tourism industry.

Interestingly, although Thailand was not the only destination impacted by the tsunami, it was disproportionately highlighted within the media. Once stories of loss were reinforced, images and perceptions were continuously told, and Thailand became the center of the disaster.

Tourism was one of the hardest hit sectors in terms of infrastructure over the ordeal, yet tourism bodies remained ineffective in advocating for the industry.

Significant reflection was conducted post disaster. Changes were made to the planning, ensuring greater distance from the foreshore for developments, awareness campaigns and communication efforts have also been enhanced to help reduce impacts.

Have the confidence to imagine and the courage to act – to anticipate futures not previously experienced.

USA

Strategies for crisis preparedness of tourist destinations (2017)

For destinations, having a strong crisis mindset, including the ability to predetermine crisis risk and response, and managing information to safeguard destination reputation, is attributed to the level of preparedness at the local tourism organization (DMO) level.

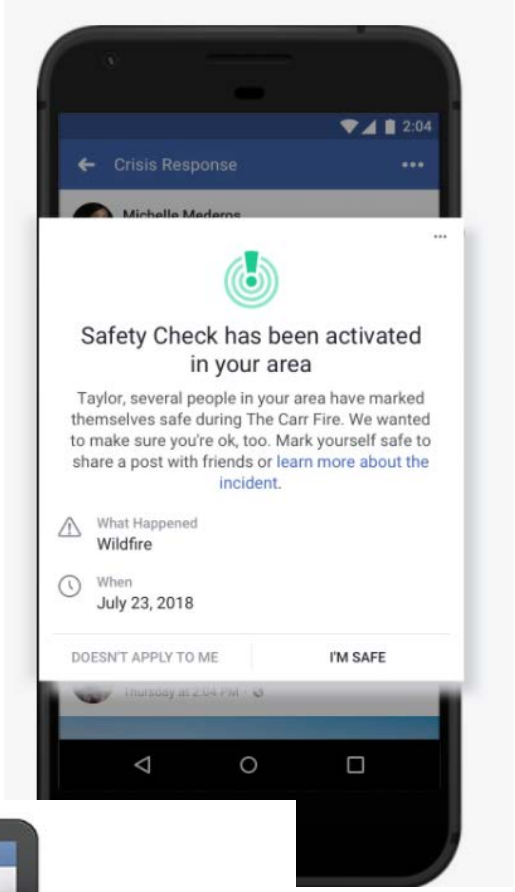
To enhance crisis readiness, tourism and hospitality professionals would benefit from developing crisis plans, establishing rapport with crisis leaders, partnering with media to provide positive messaging, and identifying strategies that can be implemented to reduce the impact of crisis on communities and ensure effective recover.

Resilience in tourism: Learning from crisis management experiences

Five key success factors have been identified in strong tourism resilience, taking learning from the Caribbean, South America, and Miami – they include:

1. Strong leadership including strategy, policy, and understanding of the market trends – risk management should be a business-as-usual activity embedded across strategies and actions within the destination.
2. Collaboration between government and private sectors – to engage operators in prevention, preparedness, response, monitoring, and recovery efforts.
3. Removal of bureaucracy and increased communication efforts – including the use of ICT enabled communications to reach broad markets.
4. Training programs – to build capacity, skills, and awareness across the tourism industry to make sure that all operators can prepare, respond, and recover effectively.
5. Creating a diversified tourism offering – to attract a balanced portfolio of visitors to do a broad range of activities.

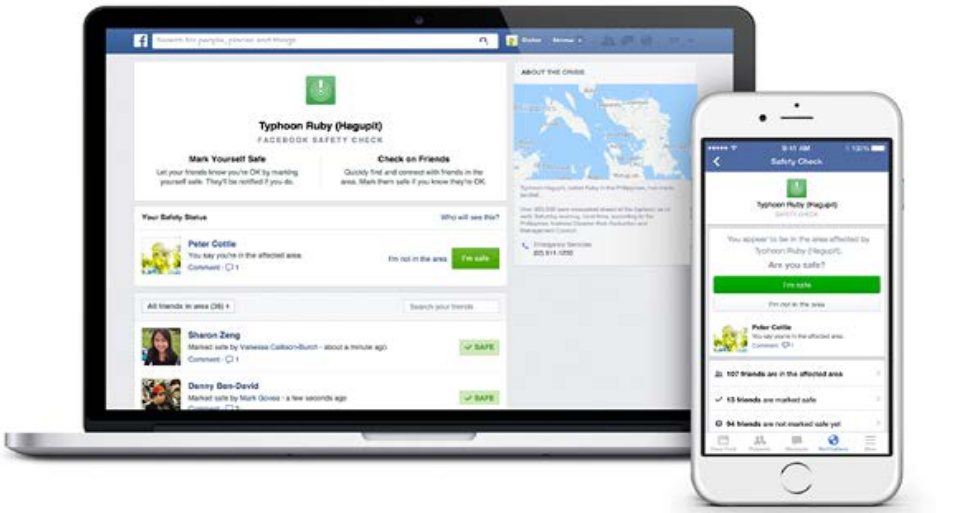
Case Study: Facebook 'Safety Check



The Facebook Safety Check feature is designed to give users' family and friends piece of mind during a disaster or crisis.

The app or mobile site enables users to mark themselves as safe during a crisis, connect with other users nearby to share resources (food, shelter, or supplies), share fundraising efforts, and get information from a variety of sources.

When a user marks themselves as safe in a crisis, a post is shared to their Timeline and News Feed and a notification is sent to all friends sharing knowledge immediately. Users can tailor the level of sharing that they wish to include.



Implications

Through the Facebook platform, users can communicate their safety quickly and effectively. For visitors to the region, this enables direct communication with concerned relatives in their economy of origin. Challenges exist when the platform is inaccessible. It also relies on the membership to the platform and is therefore not accessible to all. Whilst it is a strong signaling tool, and strong for community support, use for action among the tourism population is limited.

Viet Nam

Disaster risk reduction in Viet Nam: status report 2020

Viet Nam's GDP in the first three quarters of 2020 reflected the lowest growth reported in the past two decades, largely because of substantial slowdown in manufacturing, and a contraction in the service sector, in particular transport, tourism, and hospitality industries.

The Government took a timely and evidence-based approach to its COVID-19 response, thereby, curbing some of the impact. A clear assignment of roles and responsibilities at the time of the crisis supported a coordinated response with clear direction among critical stakeholders.

Given its previous impact from SARS, the Government has a health response in place and therefore was able to handle the outbreak remarkably well. Implementing preventative steps such as enhancing risk communication, applying information technology and, investing in science and research supported the government response.

Landscape assessment report on private sector's engagement in disaster management in Vietnam (2019)

Research indicates that impacts of extreme weather events are not localized. Rather, they create downstream economic impacts that are a significant threat to Viet Nam's GDP. Thus, local resiliency must be addressed as an economic imperative to ensure a stable business environment and Viet Nam's long-term sustainable economic growth.

Businesses deemed as resilient are typically those that are urban, have been through a crisis and have well maintained cash-flow. Conversely, less resilient businesses are typically rural, less experienced with crisis events and have little financial support.

The report recommends further exploration of a private sector network on disaster management that is funded and tasked with advocating for policy, legal and regulatory reforms.

Strategic responses to COVID-19: The case of tour operators in Vietnam (2021)

Whilst the COVID-19 pandemic has placed tourism operators in a vulnerable position, it has also provided the opportunity to restructure and redirect the tourism network towards a more sustainable future.

The report supports the critical role for governments post crisis, with tourism operators looking directly to government for financial support to support them through the challenging times they face.

Based on the tourism operators' focus on retrenchment as a crisis management strategy, the research suggests that operator focus is on the short term, rather than innovating with a longer-term outlook for their business.

Vietnam: A disaster management reference guide (2018)

The *Disaster Management Reference Handbook Series* was designed to provide decision makers, planners, responders, and disaster management practitioners an overview of the disaster management structure, policies, laws, and plans for various economies was covered in the series. Natural and man-made threats most likely to impact are discussed. E-handbooks provide basic economy background information, including cultural, demographic, geographic, infrastructure, and other relevant data.

Summary of APEC Economy Crisis Management Practices

Across APEC economies, significant work has been completed in assessing risk and vulnerabilities. Across all economies, tourism is highlighted as being an industry at the forefront of vulnerability. Not only does it operate in precarious positions (natural landscapes and urban centers), but it is also predominantly made up of MSME's who typically have less capacity to prepare for crisis.

The translation from the high-level risk analysis, the integrated risk management frameworks, and the nationwide risk management, to a practical understanding of what it means for a business and for a community is often missing. Several regions have implemented community hubs and train-the-trainer style programs to mitigate this issue and support the understanding of what the high-level strategic concepts mean for reducing risk at a local level. A greater inclusion of the tourism sector and consideration of transient populations at this stage may support a more coordinated approach in times of crisis. It is important for government to consider the high levels of touch that the tourism industry has, not only with the transient visitor population, but also with the broader community.

There has been some rather limited integration of ICT in the response to disaster and crisis management across the tourism industry. Key areas of use include:

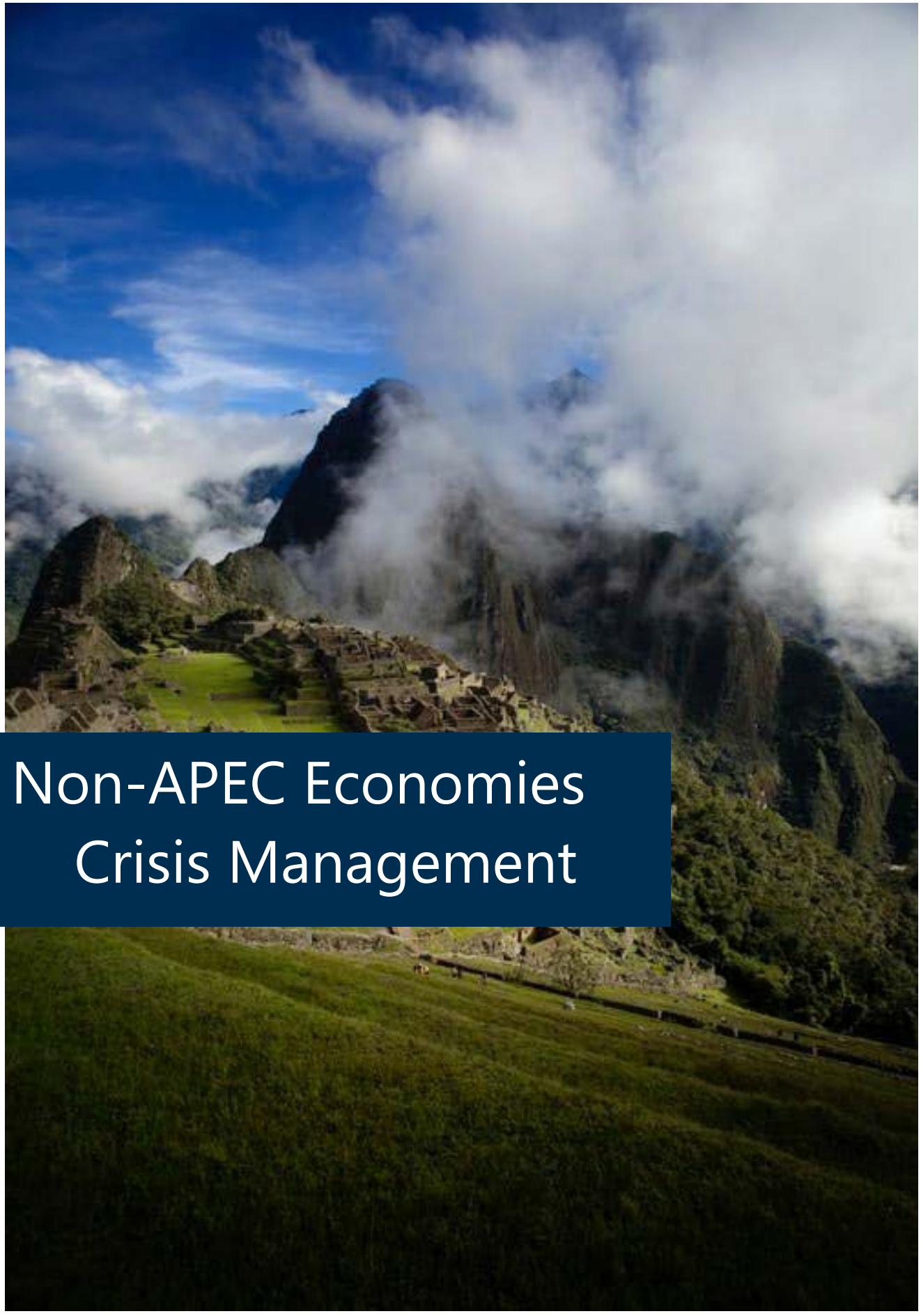
- Risk identification
- Data mapping
- Capacity building
- Social media

However, based on the research, it is evident that there is an opportunity to further embed ICT as a part of a crisis management models for the tourism industry.

Lessons learnt from destinations where communications are cut during crisis events highlight the role of alternative mechanisms such as community speakers in high-risk areas. Ensuring equitable access to infrastructure and facilities to embed ICT as part of the system will be an important management consideration moving forward.

Capacity building and training is a core theme across member economies. Whether tourism related stakeholders, broader community members or government officials – the need to create an environment where there is a strong level of understanding of the risks faced is critical to be able to mitigate. However, findings indicate the MSME's are often constrained by a lack of time, working in their business rather than on their business, not enabling them the capacity to upskill in areas that would support their resilience. ICT could play a significant role through micro-credential learning, through online programs and creating a network of support among MSMEs, not taking them out of their business but enabling them to receive the knowledge they require.

Overall, whilst at a high-level significant investment has been made to strengthen resilience and reduce risk, the practical, on-ground delivery still relies on individual business understanding and willingness to commit to preparedness and prevention. Many of the reports spoke of creating an environment of incentives to encourage operators down this path, other policy levers and ties to broader tourism programs (marketing, incentives, product development) should be considered to create risk management and crisis preparedness as a business-as-usual activity.



Non-APEC Economies Crisis Management

Non-APEC Economy Responses

Spain and Portugal coordinate cross-border emergency response efforts (2017)

Emergency and crisis situations, like tourists, do not see arbitrary lines on maps – borders make no difference. Therefore, coordinated responses are important in delivering a swift and efficient response. The AREIM-112 program was designed to create a coordinated response from both sides of the Spanish and Portuguese border, reducing barriers caused by regulations and language barriers. The result a more efficient use of resources from three partner regions, quicker response times and more lives saved.

The structured approach involves a clear emergency framework and protocol to follow, joint action plans, new technology, joint training drills and shared resources. Technology employed included computer applications, drones, video conferencing, thermal cameras, and geographic information system (GIS) mapping, as well as traditional disaster management equipment such as tankers, firehoses, smoke detectors, and autonomous breathing systems.

Whilst not associated directly with the tourism industry, the cross-border approach demonstrates leading practice in response in supporting swift and effective response.

A Proposal for Assessing Digital Economy Spatial Readiness at Tourism Destinations (2021)

ICT has revolutionized the way that tourists are consuming destinations, that they are planning, interacting, sharing experiences, and communicating.

ICT is recognized as a critical aspect of the visitor experience, however, despite its role in delivering destination experiences, there is still a lack of connectivity in high footprint visitor areas. ICT readiness is not equal across economies.

In the Balearic Islands (Spain) it was identified that there are still gaps in connectivity. GIS mapping highlights opportunity for investment by the DMO or councils in high tourism areas (based on bed nights). This research emphasized a lack of equitable accessibility across the islands, whilst the Balearic Islands are relatively well developed, this raises challenges of accessibility and connectivity among less developed economies too. To rely on ICT infrastructure during a crisis requires access to it to begin with.

Greece

eTourism Developments in Greece: Information Communication Technologies adoption for the strategic management of the Greek tourism industry (2004)

Research indicates that MSME's in Greece are lagging in relation to their engagement with eTourism and strategic business planning. Over the next decade, rapid work needs to be done among tourism businesses to engage with eTourism opportunities to strengthen businesses.

There is a key role identified for DMOs in upskilling, coordinating, and regulating and supporting operators in fostering the adoption of technology across businesses. From ecommerce to destination and crisis management, significant work is required to support the transition.

Disaster Recovery Practices and Resilience Building in Greece (2021)

Existing research suggests that there is an ability and inherent capacity for community to cope with risk and disaster. Therefore, there is the need for efficiency in response and action. This research in rural and mountainous island areas of Greece identified that there is often a lack of capacity and support among small communities, and therefore, resilience is impacted by social attitude and capacity.

In such cases, safety culture, risk management practices and resilience are facilitated through local knowledge – where available. Social attitude and perceptions dictate the level of preparedness and the efficiency of response in crisis situations.

This research indicates that there is a lack of understanding of how tourism fits into these complex communities. In highly seasonal areas where there is a large influx of tourists, how these are dealt with in crisis situations, and what that means for the safety culture of the region is lacking consideration. More work is required to build a strong culture of proactive risk management in rural communities and to increase consideration of transient populations during tourist seasons.

Spain

SEGGITUR – Spain

SEGGITUR recognizes the challenge of digital transformation among tourism destinations and companies. The value of such transformation includes greater competitiveness, professionalism, commercialization, efficiency, and sustainable development.

SEGGITUR explores solutions to drive technological innovation in tourism, providing models, examples, and engagement with digital transformation across the tourism industry from both supply and demand perspectives.

Research conducted by SEGGITUR between 2003 to 2018 identified that tourism has considerable ways to go to reach the maturity of other sectors in terms of the level of innovation, technological application, and extension of knowledge. Key barriers include finance, scarcity of funds, difficulties in creating collaborative partnerships, dominance of established (often multinational organizations) and difficulties in recruiting skilled and qualified personnel.

Programs led by SEGGITUR include:

- Digital promotion – raising the visibility of tourism destinations across Spain attracting preferred markets through web portals and social media.
- Digital transformation – working with tourism businesses to build capacity, respond to challenges with new technological solutions and change business models.
- Smart tourist destinations – digital led destinations data led decision making at their core with sustainable development enhancing the lives of the people who live work and play in tourism areas.
- Internationalization – focusing on destination management solutions through digitization. SEGGITUR works to disseminate knowledge and good practice technological innovation in international tourism markets to support MSMEs in becoming export ready.
- SDG and Sustainability – managing quality across Spain developing a culture of continuous improvement and an attitude of recovery and value of resources.

Marketing 2.0 applied to the tourism sector: the commercial function of the websites of destination marketing organizations – Spain

Websites have long been a marketing tool for destinations to attract visitors. However, as destinations and consumer expectations have evolved, so too have the opportunities for embedding functionality with web-based platforms. New opportunities for e-commerce in the sector exist among other opportunities.

Web 2.0 provides greater interaction between destinations and consumers; it simplifies processes and encourages engagement. Destination specific websites support the promotion of unique tourism brands reaching consumers across all stages of the travel lifecycle (dreaming, planning, booking, travel and sharing). There are also opportunities for destination sites to link directly to tourism operators or to act as booking intermediaries themselves.

These websites act as an important source of visitor information, in most cases offering destination specific information including transport (except in the case of Alicante).

Whilst this research paper does not directly reflect the implications of crisis management, these DMO led, destination websites are a trusted source of information among the transient visitor population. With web 2.0 and commercialization of the DMO website, there is a push to increase e-commerce and therefore, the visibility of the site, thus increasing awareness across the visitor's population. For visitors to regions with limited information, these sites may be utilized in crisis and disaster situations, and therefore, have hidden information that can be published when required to support DMOs in facilitating an efficient response and supporting a population that lacks regional knowledge.

Great Britain and Ireland

Dealing with floods toolkit

The most prevalent crisis to impact and influence Britain is flooding. As such, the DMO, Visit Britain release the *Dealing with floods* toolkit. The toolkit supports businesses to assess the flooding situation, work with others, communicate with customers, deal with cancellations, address future impacts, return to normal post flooding, and identify where to seek further support.

The toolkit is a digital based kit with templates to support businesses through the crisis.

Designed for a specific crisis, the toolkit is made with tourism in mind. Whilst at a fundamental level it integrates ICT as part of the solution, it does so in a rudimental way that enables accessibility for all operators.

Crisis communication and recovery for the tourism industry: lessons from the 2001 foot and mouth disease outbreak in the United Kingdom (2004)

The United Kingdom (UK) lacked preparedness for the foot and mouth outbreak. The response was considered inconsistent due to a lack of information available across the United Kingdom. From a recovery perspective, marketing was limited due to the length of the outbreak and the impact of the disease on communities.

The impact of foot and mouth highlighted the need for a formal crisis communication strategy to disseminate key messages between critical stakeholders across the tourism network. Consistency in messaging across UK, state and regional tourism bodies and tourism operators is important in crisis situations to reduce market confusion and support businesses.

The role of strong internal and external communication is highlighted across this case and the need for effective and timely communication in times of a crisis. Recovery marketing and messaging to consumers is only effective once the crisis has been responded to, otherwise, confusion is created in the market.

Whilst not engaging ICT due to the time of the case-study, a clear role now exists in ensuring communication and messaging is effectively delivered.

Scottish tourism emergency response group (STERG)

The STERG is a coordinated group of tourism operators responding to problems and crises that resulted from the COVID-19 pandemic.

The group originated from the COVID-19 pandemic specifically to support the recovery of tourism businesses. Focus was predominantly on financial help for industry, ensuring support was targeted in the most effective way and available to all residents.

Brexit anticipated economic shock on Ireland's planning for hospitality and tourism: resilience, volatility and exposure

The research explores the impact of a potential economic shock caused by Brexit on the Irish economy and tourism industry, specifically exploring the readiness of tourism stakeholders.

Findings indicate that the industry believes that preparedness and readiness for shock lies with government and not private business. Businesses also felt they had little control over the volatility of the sector and anticipated rapid change due to Brexit.

Despite the foreseen nature of this crisis event (a rarity in crisis management), there was still a lack of willingness to act among businesses and there was little tangible action taken by tourism businesses to prepare for Brexit. This finding is telling of the nature of responsiveness of businesses and is important when considering unforeseen events where there is even less preparedness. Further support and encouragement are required to engage MSME's in preparedness activities.

Case Study: What 3 Words

What 3 Words has changed the way we can communicate location by using three words as a unique identifier for a 3m x 3m (10ft x 10ft) plot. The developers created this innovated global addressing system by dividing the world into 57 trillion squares and using 40,000 words to create a unique identifier for each square, creating a more precise address to any location. There are over 400 partners across 170 countries using What 3 Words, from governments, businesses and humanitarian organizations.

United Nations Office for the Coordination of Humanitarian Affairs endorses the free crowd-sourcing app for natural disasters and crises. The tool incorporates with common GPS systems such as Google Maps, Citymapper and Waze on almost all smart phones and computer devices as well as emergency service software's, online and offline.

The key purpose of What 3 Words is not about navigation, but rather *knowing where you are located should an emergency occur*.

In an emergency, street addresses often are not accurate enough to specify precise locations and may not exist in rural areas or bushlands. Latitude-Longitude coordinates can be difficult to communicate via phone or radio and are prone to human errors. A three-word address is easy to remember and quick to say over the phone or message. The app has speech-recognition technology to assist in the accessibility of the tool. The preciseness and simplicity of three words allows clearer communication between people and their locations to emergency services and assistance.

Emergency services, businesses and risk management teams around the world are utilizing this tool in their day-to-day operations to assist in disaster and rescue situations, as well as mapping key access points to larger facilities. The Glastonbury Festival in the UK mapped the venue grounds to show exact positions for key assets, infrastructure, and roads to assist in coordination of responder teams in case of an emergency.

For operators in rural areas, the tool is invaluable. It can be used for clients and mitigate the risk of them becoming lost along walking trails; efficiently alert emergency services to a precise location in rural nature; and assist in identifying the location of the operator's site and key assets for coordination of employees in a disaster event.

Caribbean

Dominica climate resilience and recovery plan 2020-2030

Hurricane Maria (2017) directly impacted 80% of Dominica's population. In response, the economy developed the vision for a *Climate Resilient Dominica* to reduce the impact and recovery from climatic and other shocks, and to boost socioeconomic development.

Three pillars form the basis of the plan – climate resilient systems with robust financial systems, prudent disaster risk management and effective disaster risk response and recovery.

The plan includes the development of the Centre of Excellence for Resilience Decision Making – including dedication GIS software, telecommunications, and broadcasting for a data-driven approach to decisions. The center should be fully functional by 2022.

Actions also function around the Blue Economy, supporting sustainable businesses in the marine environment and balancing the triple bottom-line of sustainability.

The priority actions identified, alongside forty initiatives, are designed to meet 20 specific resilience targets by 2030. The cost of investment in the targets are designed to be less than if the interventions were not made.

Hurricane and storm tracking for the Atlantic and Pacific Oceans

Whilst not specifically for the tourism industry, StormTrack system is an ICT system designed to identify topical depressions, storms, and hurricanes to offer early advice to Caribbean authorities to support early action in communities.

Planning for disaster risk reduction within the framework of the 2030 agenda for sustainable development

Supporting cross boundary disaster responses to better prepare for crisis, inter-agency coordination is identified as essential to underpin policy and operational decisions. A paradigm shift is required to reduce inequality in crisis response and support resilient and sustainable futures.

Mainstreaming gender into disaster risk management for tourism: training manual (2018)

Part of a five-year program, this training was designed for knowledge sharing and skill development in disaster management amongst the tourism sectors. Building on previous work it was designed to enhance the technical capacity of tourism operators to integrate gender sensitivity in disaster management to reduce vulnerabilities and enhance resilience.

Research indicates that there are currently varying levels of knowledge about gender response to crisis, that there is limited technical skill and capability to integrate gender perspectives into risk management policies and programs for the tourism industry. A practical tool to support the enhanced knowledge and skills in policy and practice was identified.

As such, a training manual was developed that offered insight into how to understand gender mainstreaming and gender analysis in response to climate response and risk management; how to reflect gender in policy commitments as per global best practices; and how to create gender-sensitive responses to disaster prevention, mitigation, preparedness, response, recovery, and rehabilitation.

Regional disaster risk management for sustainable tourism in the Caribbean project (2007)

A collaboration between the Caribbean Disaster Emergency Response Agency with the support of the IDB and in collaboration with the Caribbean Tourism Organization; CARICOM Regional Organization for Standards and Quality; and the University of the West Indies led to the development and implementation of regional disaster risk management for the tourism industry in the Caribbean.

The program, aligned to the *Sendai Framework* supported mitigation, preparedness, response, and recovery.

The outcome of the program, a set of templates to support the development of crisis management plans including the set up and overview, the why and need for the strategy, the identification of risk and how to implement.

Case Study: The Bahamas – A Coordinated Response

A region no stranger to the impacts of natural disasters, the Bahamas comprises of over 700 islands and 2,400 cays is located to the east of Florida.

Bahamas Disaster Management

The National Emergency Management Agency (NEMA) is the lead agency across the four phases of disaster management – planning, preparation, response, and recovery for the Bahamas.

Guided by the *National Disaster Plan*, the group has a process, structure, and systematic approach to addressing the impacts of crisis, disaster, and emergency in the region. A coordinated approach is taken with NEMA at the helm aligning support agencies to return the region to normal as effectively as possible.

A Coordinated Approach

There are 13 agencies involved in emergency support and responses: this covers emergency services, transportation, tourism, governmental, private, and non-governmental organizations, and other support services.

The Ministry of Tourism and Aviation coordinates activities to ensure that the tourism industry can effectively respond to and recover from crisis. In addition to the Ministry, key organizations such as the Airport Authority are represented to ensure the delivery of a coordinated response.

In addition to its role in NEMA, the Ministry of Tourism and Aviation also holds an Emergency Coordinating Committee responsible for monitoring crisis events and coordinating with hotels and tourist offices across the island. This focus on visitors to the region ensures that all people are cared for during a disaster event and those with little knowledge of the local area are well communicated with during the event. The committee also supports the rebuild once a disaster has finished.

Identifying and Responding to Key Hazards

The region identifies hurricanes, associated hazards, and ocean surges as the primary risk for the region. As such, NEMA developed a set of resources around hurricane preparedness and response to support industry in its response. The toolkit has the aim of minimizing the impact of these types of disaster on the islands, to protect the image and to coordinate resources to deliver a swift response.

A key part of hurricane preparedness is rehearsing response plans to ensure effectiveness when required and to support staff in understanding roles and responsibilities during a crisis event.

ICT for Damage Reporting

The Ministry, through the Hurricane Kit, provides a damage assessment tool that operators submit to the Bahamas Hotel and Tourism Association once the disaster has occurred. This ensures a consistent framework for reporting. Through the use of ICT, this online, mobile friendly questionnaire, creates real-time data for the Ministry on where the damage is. This online tool to build damage assessments has replaced paper-based processes that previously took months, and on occasion years, to be collected and processed by policy makers.

The tool also enables policy makers to prioritize rehabilitation, rebuild and support communities with preparedness where most damage was identified.

Implications

Tourism is embedded as a central stakeholder within the *National Disaster Plan* framework, with both industry and visitors considered in crisis preparedness, response and recover.

A strong scientific foundation fosters credibility and is essential to understand what crisis and crisis impact is likely to happen and how best to prepare and respond to it. Understanding the biggest risks to the region enables a coordinated response to ensure an efficient and practiced recovery.

Actively integrating the tourism industry in crisis management planning, e.g., working groups, ensures that tourists are considered in response procedures but also ensures that the tourism industry can play an effective role in response and recovery.

Though a centralized reporting system, Government can obtain relevant, timely, and consistent reports on the state of industry and can address challenges and response measures based on real-time data enabling a quick and effective response.

Case Study: CRIS – Caribbean Risk Information Systems

The Caribbean Risk Information System (CRIS) is a risk management system hosted on a virtual platform that provides data and research to build awareness of risks that face the Caribbean.

The online platform offers three key aspects, GeoCRIS, a Virtual Library, and Databases. All provide access to knowledge and information to enhance understanding of the climate threats and risks to the region. This is designed to strengthen disaster preparedness, build evidence-based decision making and contribute to the overall sustainability of the region. The program was designed specifically to solve challenges identified within the region including a lack of data and information availability and un-sustained hosting capacities.

To address these challenges the following is provided through CRIS:

- GeoCRIS offers geospatial data for each of the contributing regions. The library includes documents from partners on climate adaptation and disaster risk management, while the databases provide insight into early warning systems and risk profiles.
- CRIS acts as a live emergency log in case of an emergency as a disaster management dashboard where stakeholders can access key information to make data-led decisions in real-time.
- The program is funded through a partnership between the World Bank with financial support from the EU in the framework of the *ACP-EU Natural Disaster Risk Reduction Program*, managed by the GFDRR.

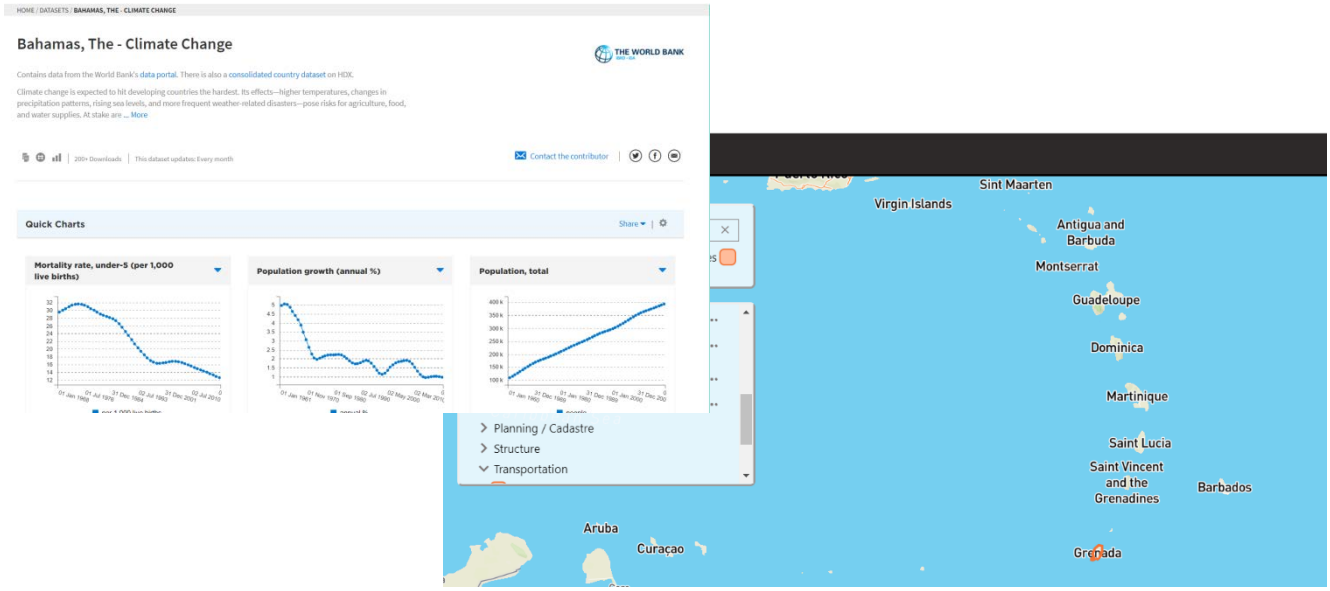
Implications

This free to access tool has facilitated data-led decision making to all stakeholders across participating Caribbean economies.

Live updates through crisis situations create a source of truth for business leaders, communities, and other interested parties to monitor and respond to, enabling a more effective response strategy to whatever natural disaster or crisis they may be impacted by. The structures and learnings taken through preparing for climate change and natural disaster can be adapted to other crisis that may influence and impact a business. However, there is little discussion about preparedness for other crises beyond natural disasters within the region (understanding these are the biggest threat).

For MSME's, big data is often unobtainable; free access means there is more opportunity to use it. However, the communication will need to be clear on how to utilize this platform and what it means for a tourism operator. When is it time to evacuate, what do the warning signs

look like, what does the climate data mean for daily business operations? Interpretation of the data is just as important as the access to it. This is currently missing through this program.



Phase 1 – Conclusion

It is broadly understood that tourism is a vulnerable industry physically, socially, and economically. A broad range of policy, toolkits, strategies and research projects at a multinational, economy and localized level have been put in place to support tourism sectors across APEC economies to enhance resilience and build capacity. Yet there is still considerable work to be done.

Aligned to the *Sendai Framework*, the role and responsibility of crisis management sits with *all* stakeholders. Coordination and collaboration are critical for success. Their role extends across all areas of understanding crisis risk, strengthening governance to manage risk, investing in risk reduction, enhancing in preparedness, and building back better.

Whilst ICT has been employed successfully in part as a tool to support crisis preparedness, prevention, response and recovery, there is still more that can be done to further integrate tools to support response in a more strategic approach. Barriers need to be better understood to engage operators with further integration in their operations.

This study has explored the broad array of research studies, international aid contributions, toolkits and support materials for economies and businesses both generally and specifically within the tourism industry. The study identifies key learnings to understand the levels of vulnerability and engagement with ICT among APEC economies. Common findings indicate a lack of preparedness and a vulnerability, despite best efforts of government sector partners to deliver programs to support organizations in reducing risk.

It is evident that there is a disconnect between the high-level work being conducted and operators' willingness to engage with crisis management practices – this is often due to the MSME nature of the industry and the lack of time and resources for focusing on strategic practices to support the business. Understanding of risk is also a key barrier to engagement, perceptions of the level of risk to business may stifle engagement, risk not being prioritized and other activities (marketing and demand driving) taking precedence.

There is also greater opportunity to embed the use of ICT across all stages of crisis management, from understanding disaster response, all the way through to data driven processes to support building back better. Creating an environment that makes understanding and managing risk as simple as possible for MSMEs is critical in engaging them in the crisis management and preparedness process. The use of ICT is lacking not just within crisis management, but tourism appears from the research as a laggard in general in the adoption of technology (innovative or not).

It is important to note, just because tourism is not prepared, it does not mean that it is not resilient. The impacts of COVID-19 have proven just how resilient the industry is. Given the right tools to support business as usual practices further, opportunities exist to strengthen the industry.

PHASE 2 – PRIMARY RESEARCH

Phase 2 - Introduction

This report explores the vulnerabilities of tourism operators (MSMEs) and the use of ICT to support disaster prevention, preparedness, response, and recovery through the responses to survey data. A brief overview of the use of ICT in tourism disaster management is provided followed by an overview of the *Sendai Framework*, to which this research aligns.

The report provides detail into the primary research methodology applied to collect 250 responses from tourism operators in APEC member economies. Insight and implications drawn from this research are presented.

Context

Globally, a total of 1.5 billion international tourist arrivals were recorded in 2019 (pre-COVID-19 benchmark). As global visitor movements peaked (increasing 4% on 2018), tourism leaders called for more sustainable and responsible management of destinations[14].

As 2019 ended, several challenges influenced the tourism sector, slowed economic conditions, and presented unique operating environments for businesses both in tourism and across a range of other sectors. Britain leaving the EU ("Brexit"), the collapse of global travel company Thomas Cook, and geopolitical and social tensions all served as a stark reminder to tourism businesses of the vulnerabilities of the environment in which they operate. Further challenges from changing climatic conditions resulted in bush and wildfires, floods, cyclones and hurricanes, and other natural disasters that continue growing pressures on an already unstable system.

In March 2020, the World Health Organization confirmed that COVID-19 was a global pandemic[15] and by mid-2020 100% of destinations globally had imposed some form of travel restrictions[16], further shaping and constricting the operating environment for tourism business owners and workforce.

Global tourism experienced a 4% upturn in 2021 when compared with 2020. Yet, international tourist arrivals were still 72% lower than pre-pandemic (2019) figures[17]. The loss of international arrivals was expected to put up to 120 million direct tourism jobs at risk.

The challenges faced over the past two years highlight the vulnerabilities of the tourism industry. Economies dependent on tourism (e.g., Macau (50% of GDP), Maldives (33% of GDP), Aruba (32% of GDP)), were especially hard hit by international travel restrictions and reductions in consumer confidence in travel.

14 UNWTO - INTERNATIONAL TOURISM GROWTH CONTINUES TO OUTPACE THE GLOBAL ECONOMY. https://www.unwto.org/international-tourism-growth-continues-to-outpace-the-economy
15 World Health Organisation. WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020. https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020
16 United Nations World Tourism Organisation (UNWTO). 2020. International Tourism and COVID-19. https://www.unwto.org/international-tourism-and-covid-19
17 UNWTO - https://www.unwto.org/news/tourism-grows-4-in-2021-but-remains-far-below-pre-pandemic-levels

For economies with healthy domestic (residents travelling within the economy) tourism markets, these markets have started to drive some form of recovery across the sector. Consumers showing preference to travel close to home, in the open-air, enjoying nature-based experiences or rural activities.

There is no questioning the tourism sector is vulnerable to internal and external risk. Vulnerability is defined as the *propensity, sensitivity, or susceptibility to be harmed or adversely affected whilst lacking the capacity to cope or adapt*[18]. Tourism's reliance on a complex network of interconnected stakeholders and dependence on other industries often challenges its sustainability and viability and increases its vulnerability. Research highlights the need for policy makers to implement resilience building policies to support adaptive capacity of businesses and reduce vulnerabilities[19]. Aligned to this definition, steps to achieve reduced vulnerability come through awareness and understanding of risk management processes and the skills to deliver outcomes.

It is important to note that resilience and vulnerability are not necessarily on a spectrum, just because a business, a destination or a community is vulnerable in certain areas does not mean that it is not resilient to impact. Also, just because resilience is demonstrated, does not mean that there is no vulnerability.

Vulnerability in tourism takes many forms. Whilst often the physical vulnerability is considered first due to the location of destinations and attractions in areas of outstanding natural beauty, or urban centers[20], vulnerability also comes in the form of financial, social and reputation through destination image[21]. Tourism as an industry is reliant on a complex network of systems, structures and supply chains including transportation networks, electrical and water systems, and agriculture supply. Disruption across any part of this system can have significant implications for tourism that erode confidence, destination image and can disrupt travel - at best for the short-term and at worst cause long-term implications[22].

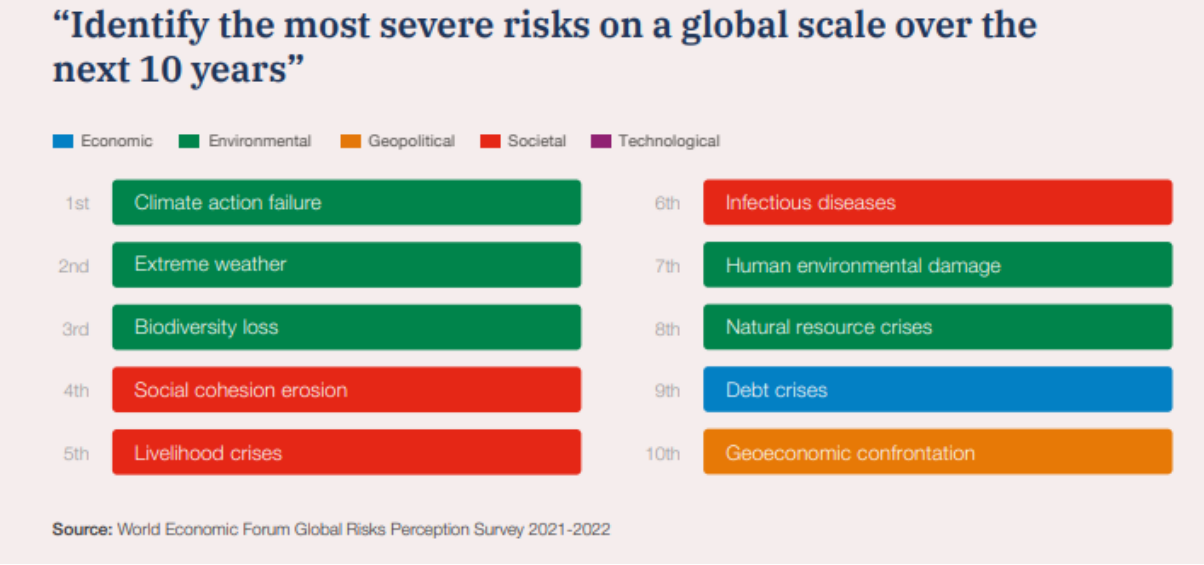
In 2022, WEF *Global Risk Report 2022* highlighted the interconnected risks that are being felt by communities (Figure 1). Even before COVID-19, the risk environment was being shaped by an unsettled geopolitical landscape, where power, partnerships and norms were being tested and creating turbulence.

The past five years were the hottest on record globally; this resulted in challenging bushfires, floods, and cyclones. The number of cyberattacks also increased over this period and protests about political and economic conditions and inequalities were at an all-time high. Then came a global pandemic, impacting health, employment, and trade. As we continue to grapple with the effects of COVID-19 on public health, uneven recovery will be witnessed globally. Risk of

18 IPCC. (2014). Summary for policy makers. In C. B. Field, V. R. Barros, D. J. Dokken, K. J. Mach, M. D. Mastrandrea, T. E. Bilir, M. Chatterjee, K. L. Ebi, Y. O. Estrada, R. C. Genova, B. Girma, E. S. Kissel, A. N. Levy, S. Maccracken, P. R. Mastrandrea, & L. L. White (Eds.), *Climate change 2014: Impacts, adaptation, and vulnerability*, 4-6. Cambridge University Press. [Google Scholar]
19 Mark Crosweller & Petra Tschakert (2021) Disaster management leadership and policy making: a critical examination of communitarian and individualistic understandings of resilience and vulnerability, Climate Policy, 21:2, 203-221, DOI: 10.1080/14693062.2020.1833825
20 N.Brown, J. Rovins, S. Feldmann-Jensen, C. Orchiston & D. Johnston. **Exploring disaster resilience within the hotel sector: A systematic review of literature.** I.J. or Disaster Risk Reduction. 22. (1) (2017). Pp 362-370. C.-H. Tsai, T.-c. Wu, G. Wall, S.-C. Linliu. **Perceptions of tourism impacts and community resilience to natural disasters** Tour. Geogr., 18 (2) (2016), pp. 152-173, 10.1080/14616688.2016.1149875
21 S. Becken, R. Mahon, H.G. Rennie, A. Shakeela. **The tourism disaster vulnerability framework: an application to tourism in small island destinations.** Nat. Hazards, 71 (1) (2013), pp. 955-972, 10.1007/s11069-013-0946-x
22 D. Pearlman, O. Melnik. **Hurricane Katrina's effect on the perception of New Orleans leisure tourists**. J. Travel Tour. Mark., 25 (1) (2008), pp. 58-67, 10.1080/10548400802164905

climate action failure is recognized as the number one long term risk on a global scale over the next ten years. The 2021 United Nations Climate Change Conference, COP26, succeeded in attaining 197 signatories to align on a common climate pact. The conference also so sought to update and strengthen economies' commitments towards a 1.5°C scenario. Yet, it is action that is now required to deliver the outcomes needed to transition communities, build resilience, and reduce vulnerabilities.

Figure 1 Long term risk outlook23



The *Global Risk Report 2022* also highlighted the leap in digitalization, brought about by the impact of COVID-19. Hyperconnectivity has made some economies more competitive, whilst others are stuck in the analogue economy. This widening gap is a concerning risk that needs to be addressed within the next five years. Alongside challenges with the widening gap on digitization, comes the increasing threat from cyber criminals leading to attacks. The rapid scaling of digitalization in response to COVID-19 has led to new vulnerabilities that communities, businesses, and individuals are required to respond to.

Considerable challenges remain ahead, starting with the unknown duration of the pandemic and ever-changing travel restrictions. Recovery is also challenged by the context of global economic recession and the need to decarbonize the economy, including tourism, to reduce future risk from climate change.

Tourism plays a critical role in reducing risk, building community resilience, and enhancing community connectedness given the nature of the service industry. It is also an industry reliant on a perception of positive image, safety, security, stability, and low risk. Therefore, understanding the vulnerabilities across the tourism network enables businesses, governments, and other critical stakeholders to address vulnerabilities and strengthen overall resilience. Yet, research indicates that tourism tends to be poorly prepared for natural disasters, frequently taking a passive approach[24]. This is often due to the small nature of

23 World Economic Forum (WEF). The Global Risks Report, 2022 https://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2022.pdf

24 S. Becken, R. Mahon, H.G. Rennie, A. Shakeela. **The tourism disaster vulnerability framework: an application to tourism in small island destinations.** Nat. Hazards, 71 (1) (2013), pp. 955-972, 10.1007/s11069-013-0946-x. N.Brown, J. Rovins, S. Feldmann-Jensen, C. Orchiston & D. Johnston. **Exploring disaster resilience within the hotel sector: A systematic review of literature.** I.J. or Disaster Risk Reduction. 22. (1) (2017). Pp 362-370.

tourism businesses and owners too busy working in the business as opposed to on the business.

To reduce the levels of vulnerability in tourism, improvement is required in the levels of education and communication. This will in-turn build resilience. To achieve this, barriers such as perceived time, awareness of risk and access to resources, the perceived use and perceived usefulness of the resources, and enhanced knowledge is required.

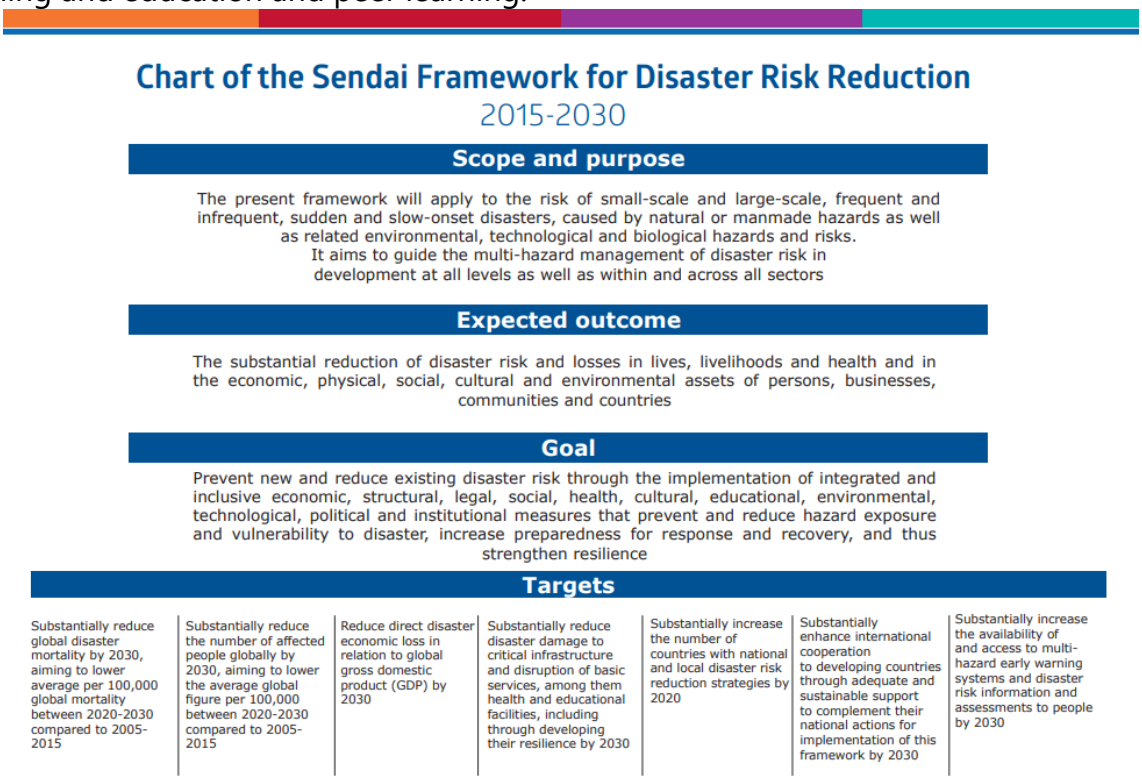
"Societies and the international community urgently need to collaborate to check COVID-19, heal its scars and address compounding global risks"[23].

Sendai Framework

The United Nations adopted the *Sendai Framework* in 2015 at the third UN World Conference on Disaster Risk Reduction. The framework overviews seven clear targets and four priorities for actions to prevent new and existing disaster risk:

- Understanding disaster risk;
- Strengthening disaster risk governance to manage disaster risk;
- Investing in disaster reduction for resilience; and
- Enhancing disaster preparedness for effective response .

The framework also articulates the need for increased understanding of disaster risk in all its dimensions of exposure, vulnerability, capacity, hazard characteristics and the environment. It is understood that the knowledge of such risk can be leveraged for the purpose for pre-disaster preparedness and prevention, for mitigation and effective response measures. To achieve this, it is important to regularly assess disaster risks, vulnerability, capacity, exposure, and potential effects in line with economic circumstances and policy conditions. Furthermore, knowledge should be built across government officials, civil society, communities, volunteers and the private sector through awareness building, training and education and peer learning.



This report supports the goal and targets of the *Sendai Framework*. Specifically, the work addressed throughout this paper is designed to build an understanding of the disaster risk across APEC economies. The process highlights the policy implications that are required to

strengthen the governance to manage disaster risk. The program takes an in-depth look at the skills, knowledge gaps, the vulnerabilities that exist and the opportunities that ICT presents to address some of these challenges.

Whilst the *Sendai Framework* is designed for broader application than just the tourism sector, this lens enables a focus to a key economic driver and employment sector.

Prevention saves lives, and under the Sendai Framework, the world has an international agreement for managing disaster risk. This latest IPCC report must be a wake-up call to fulfil the commitments made under the Sendai Framework for a stronger, safer, more resilient, and more equal world[25].

25 UNDDR – 2022- Landmark IPCC report must be wake-up call for greater investment in disaster risk reduction - UN Special Representative on Disaster Risk Reduction. https://www.undrr.org/news/landmark-ipcc-report-must-be-wake-call-greater-investment-disaster-risk-reduction-un-special

Understanding Tourism's Use of ICT in Disaster Management

The use of ICT has been identified by researchers as strong tools to manage post-disaster activities in developing economies. In Africa, ICT has successfully been employed as a recovery tool in the creation of MIS[26]. These systems can facilitate sharing and collaboration between multiple stakeholders. Furthermore, GIS and computer simulations are invaluable tools in supporting recovery in remote areas, tracking the impacts of natural disasters but also in emergency planning and preparedness[27].

Studies in China demonstrated the power of social media in disseminating information about earthquakes[28]. The research found that information was shared faster and more effectively than via traditional forms of media in direct response to the earthquake. The research was supported in Nepal (post-earthquake), with social media deemed a powerful tool in recovery efforts.

Social media however must be used with caution, as misinformation can be disseminated quickly in the lead-up to, and immediately post-disaster. DMOs need to work in close partnership with key stakeholders to ensure effective messaging. ICT has also been identified as a vehicle for undermining governance structures and systematically reducing society's ability to reduce significant problems. Reliance on communication through social media channels will need to consider evolving trends of digital detoxing – with adaptive communication being the key to resilient communities.

ICT has also directly been utilized to manage tourism flows and visitation in times of crisis. Artificial intelligence has been used for several years in airports and now in a broader manner, to screen, track, predict and survey[29]. As AI grows in roles in virtual guiding and hosting, it is likely that its role in disaster management and supporting visitor flow through challenging times will also need to increase.

Consideration of ICT in preparedness and in supporting tourism operators to build knowledge and capacity is also important. As online learning becomes a norm, whether it is active online learning, gaming, and engagement, or more passively through video content, advances in ICT to support learning have changed the way that tourism operators can build their understanding in disaster management.

26 Gossling, S. Technology, ICT and tourism: from big data to the big picture. (2021) Journal of Sustainable Tourism. 29. (5).
27 Lama, S & Pradham, S (2018. Enhancing Resilience of Natural, Built and Socio-economic Environments Proceedings of ISCRAM Asia Pacific 2018 (K. Stock and D. Bunker, eds).
28 Li, J., & Rao, H. R. (2010). Twitter as a rapid response news service: An exploration in the context of the 2008 China earthquake. The Electronic Journal of Information Systems in Developing Countries, 42(1), 1-22
29 Zulu, B. (2008), 'African officials urge use of IT for disaster management', Network World Canada, vol. 24, no. 16, p. 1.

It is also important to consider that poverty adversely affects adoption and use of ICT as a support mechanism for preventing and responding to disasters. Similarly, education of populations and increasing awareness of risk play an important role in ICT engagement and risk prevention.

Methodology

To assess the vulnerability of the tourism industry and understand how the sector currently engages with ICT, a quantitative approach was utilized. Data was collected from stakeholders across APEC economies utilizing an online survey.

Research instrument

A questionnaire was designed to collect data from a convenience sample of tourism businesses across APEC economies. The questionnaire, in both English and Spanish, was divided into five key sections to understand business structure, vulnerability, preparedness and usage of ICT.

The first section seeks to determine business structure, location, length of operation, trading status and current engagement levels with ICT. This basic business information will support an understanding of regional differences, whether there are unique challenges faced based on the size of business and comfort with ICT as a prerequisite for engagement in a disaster situation.

Following this, the next section aimed to explore the level of preparation for crisis response. Understanding awareness of types of disaster, a tourism business is likely to face, and the practical levels of preparation faced. This supports and understanding of perceived and actual vulnerabilities.

The main threats to the business were then assessed, determining the key vulnerabilities to the business.

Participants were then required to identify the type of ICT used to support crisis preparedness, response and recovery efforts, and rank the level of usefulness. Core barriers to engagement of ICT were assessed to understand what is stopping tourism businesses in utilizing ICT as part of their disaster resilience.

The final section assessed organizational culture and how disaster management, crisis response and recovery and use of ICT is embedded within the culture of the tourism organization. The survey ended seeking information on where the tourism operator perceives that they should seek support to build disaster resilience to reduce their vulnerabilities.

Population and sample method

The research was carried out on a sample of tourism businesses across APEC economies. Participants were engaged through member economies. The host economy, Peru, directly communicated with member states and disseminated the survey. In addition, the

researchers shared the survey with member-based organizations and associations across APEC economies (Appendix 1).

A complete list of businesses across all economies is not possible, therefore the sample was non-probability-based sampling and took the form of convenience and snowball sampling. The lead economy engaged a research company to complete 200 surveys in Peru.

The questionnaire was distributed online through SurveyMonkey. Data was collected from November 2021 to February 2022. It is important to note that during this time, COVID-19 variant omicron was significantly impacting the health of economies and consequently travel behavior. Furthermore, the Christmas and New Year's period are significant for tourism operators, often leaving little time for actions other than working in their business. A total of 300 responses were received. Of these, 250 completed, usable responses were submitted.

The results are based off a non-random sample and therefore may not be representative of the broader population. Insights and observations the results produce should not be extended in all respects to the entire population group. Whilst caution should be taken when generalizing from the results, we are confident that the insights provided are a true reflection of the tourism sector, that they align with previous research conducted in this field and provide a reliable picture of vulnerabilities and disaster resilience in the tourism industry.

Analysis

Initial descriptive data analysis was conducted to present an overview of respondents to the survey. Following this, comparative analysis was conducted between the two larger samples, Australia, and Peru. Whilst some narrative is provided around other economies, sample sizes are small, and these results are indicative only and care should be taken not to generalize from this sample.

A Kaiser-Meryer-Olkin measure of sampling adequacy was conducted with the results indicating that the sample is suitable for factor analysis. Bartlett's test of sphericity indicates perfect orthogonal data and data compression is not required.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.920
Bartlett's Test of Sphericity	Approx. Chi-Square	13318.585
	df	2145
	Sig.	.000

ANOVA analysis was conducted to compare the means of specific sample groups. Specifically, this test was conducted across different sized businesses, type of business structure and company history to determine whether these factors influence crisis preparedness, response, and recovery in a meaningful way. Samples from Peru and Australia were also large enough to provide a comparative analysis.

Secondary data

This research also draws on secondary data from previous disaster management surveys conducted by EarthCheck across Australia, specifically exploring preparedness and barriers to engagement with disaster management. The data is used to augment the perspectives outlined within this research and further explore challenges and opportunities faced by tourism MSMEs.

Results

Business profile

A total of seven of the 21 APEC member economies participated in the study. Respondents came from Peru, Australia, New Zealand, United States of America, Japan, Mexico, and Papua New Guinea.

Typical of the tourism industry, the sample demonstrates it is comprised of MSMEs (Mode=2, Mean=10.2). Of the participating businesses in the survey. Table 1 below highlights the size of businesses; Table 2 highlights the type of businesses and Table 3 highlights the trading age of businesses

Table 1: Size of business

Number of employees	Frequency	%
1	68	27.2%
2-5	143	57.2%
6-10	14	11.2%
11-15	12	4.8%
16-20	7	2.8%
21-25	2	0.8%
26-30	0	0.0%
31-35	0	0.0%
36-40	2	0.8%
41-45	0	0.0%
46-50	1	0.4%
51-55	1	0.4%
56-60	0	0.0%
61-100	1	0.4%
100-200	1	0.4%
200-300	0	0.0%
300-500	1	0.4%
>1000	1	0.4%
(Blank)	1	0.4%

Table 2: Business structure

Type of business	%
Partnership	62.7%
Limited liability company	30.5%
Sole trader	4.4%
Branch of overseas company	1.2%
Other	0.8%

Table 3: Trading age/ history

Number of years	%
5-9 years	37.6%
1-4 years	25.2%
Over 15 years	18.4%
10-14 years	14.0%
Less than 1 year	4.8%

Whilst not all businesses engaged in the survey were MSMEs, a total of 85% of the respondents to the survey had 5 or less employees. Most businesses (63%) have been trading between 1-9 years with almost 95% of participants in operation for over 1 year.

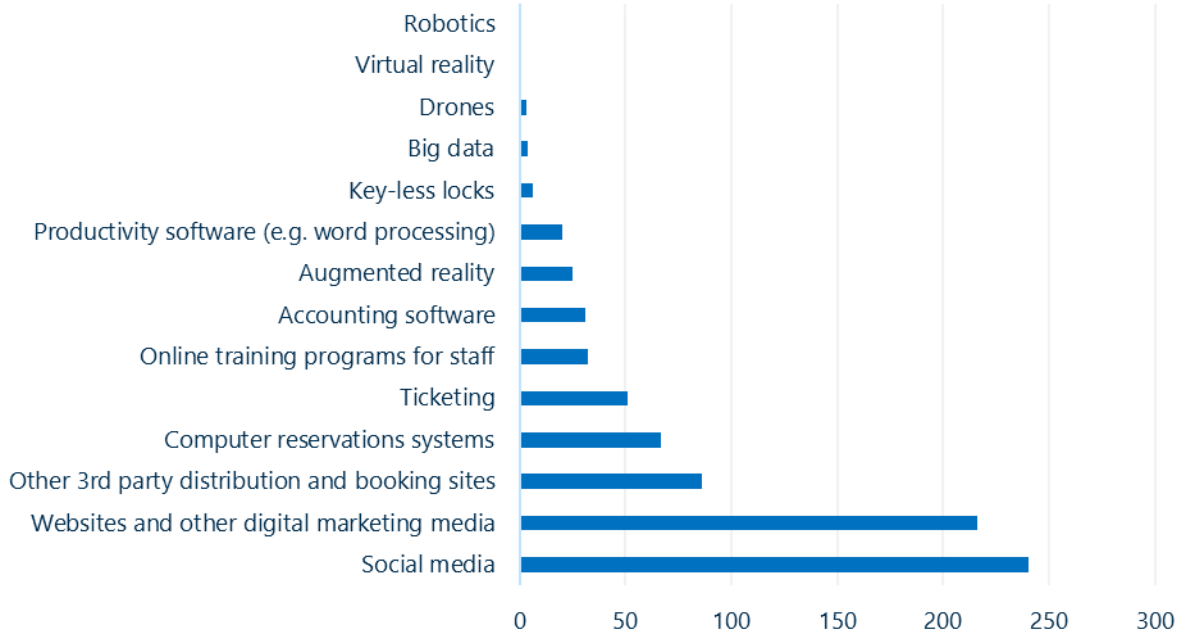
Businesses were asked the trading status to determine whether they operate on a seasonal or economic cycle, year-round or the impact that was felt by COVID-19. Of the respondents, 35.9% operate year-round, 2.0% seasonally, and a significant 54.0% were impacted by COVID-19.

Existing use of technology

Businesses were asked to highlight the top three (3) types of ICT in their business currently – in other responses, one outlying respondent noted the utilization of over 30 software as a service solution (SaaS).

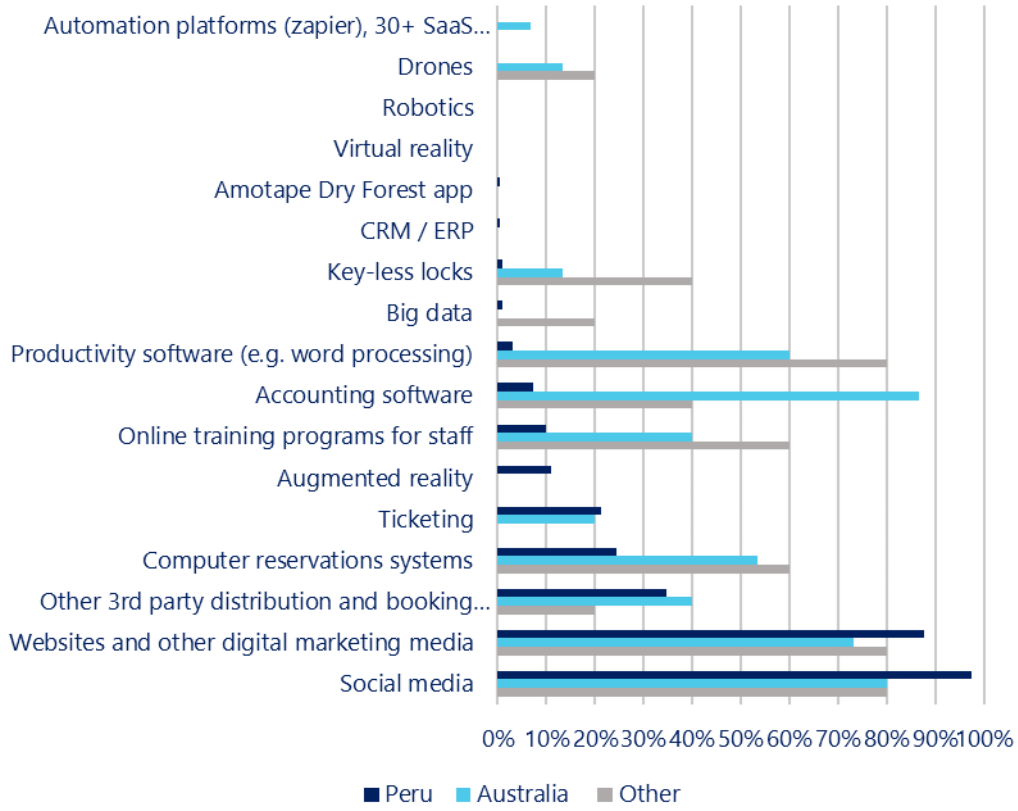
Figure 2 below highlights the prevalence and use of social media and marketing-based solutions within businesses. More innovative uses for technology have only been integrated by a small number of the respondents. Research indicates two clear barriers to engagement with technology at the business level – knowledge and cost.

Figure 2 - Current use of technology in businesses



When comparing the use of technology across economies (Figure 3), tourism businesses in Peru mostly engage with technology for social media (97.4%), web-marketing, digital media (87.8%), other third-party distribution and booking sites (34.8%) and computer reservation systems (24.3%). Comparatively, a slightly lower proportion of Australian participants identified engaging with social media (80.0%), websites (73.3%) but slightly higher engagement with third party booking sites (40.0%). Furthermore, there was higher engagement with Australian participants in productivity related technology including online training for staff (40.0% and 10.0% respectively), productivity software such as word processing (60.0% and 3.0%) and accounting software (86.7% and 7.4%).

Figure 3 Comparison of technology use



Both economies demonstrate business engagement with basic forms of technology, however limited engagement with more innovative and expensive forms of technology. Barriers to engagement are explored in detail in the *Barriers* section, however cost and knowledge were consistent across all economies engaged in the survey.

Significant investment has been made in Australia in engaging tourism operators in the use of web-marketing, social media, and online sales platforms through the state tourism organizations and the Australian Tourism Data Warehouse, however there are still gaps in this area due to blackspots in access.

A comparative analysis was conducted between businesses of different ownership structure – exploring specifically partnership structures and limited liability companies (Appendix 2). The results indicate that there is a significant difference between the way in which social media, big data, virtual reality, augmented reality, and mobile apps. Those in a partnership are more likely to use social media. Whereas augmented and virtual reality is more likely to be utilized by businesses limited by guarantee.

Understanding disaster impacts

When asked how confident respondents are in understanding how disasters will impact their business, the majority were extremely confident (Table 4). This will be further considered, in the *Disaster Preparedness* section.

Table 4: Confidence level in how disaster will impact business

Type of disaster	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree
Natural disaster will impact my business	54.5%	42.0%	2.2%	1.3%	0.0%
Health related disaster will impact my business	42.9%	54.9%	1.7%	0.4%	0.0%
Cyber-crime will impact my business	47.2%	47.6%	3.4%	1.3%	0.4%
Financial disaster will impact my business	48.6%	48.6%	2.9%	0.0%	0.0%
Political crisis will impact my business	47.4%	46.1%	4.3%	1.7%	0.4%
Other minor crisis (e.g., a localized power outage in your business or the flooding of the laundry facilities) may impact my business	23.3%	50.0%	22.4%	3.0%	1.3%

The *Sendai Framework* indicates that through understanding and knowledge of the disaster risks, businesses can reduce vulnerability by effectively preparing and mitigating. The level of confidence and understanding in disaster risk suggests the sector is well positioned to effectively prepare for, respond to and recover from disaster situations. Respondent businesses demonstrated less confidence and understanding in how minor disaster situations will impact business than they do the major disaster situations.

In examining the differences in how disasters impact businesses dependent on the length of time a business has been trading, there are significant differences in understanding how health (P=0.007), cyber (P=0.039), financial (P=0.038) and political (P=0.002) events will influence a business. In each case, confidence is at its lowest among businesses that have been operating for less than four years.

When comparing the level of confidence in disaster impact between Australia and Peru Table 5 below highlights respondents from Peru are slightly more confident in the way in which disasters are likely to impact their business (excluding financial crisis, whereby Australian businesses are more confident M=4.6). The *UNWTO Policy Measures* tracker highlights that in response to COVID-19 crisis training videos were launched to support the tourism industry, these videos have been viewed more than 11,600 times[30]. Whilst there is no conclusive evidence to link these activities, it is likely that the support measures have contributed to the confidence demonstrated among operators.

Table 5: Confidence level in how disaster will impact business

Type of disaster	Australia	Peru	Other
Natural disaster will impact my business	3.9	4.5	4.8
Health related disaster will impact my business	4.3	4.4	4.8
Cybercrime will impact my business	3.6	4.4	4.5
Financial disaster will impact my business	4.6	4.3	4.3
Political crisis will impact my business	3.2	4.5	3.0
Other minor crisis (e.g., a localized power outage in your business or the flooding of the laundry facilities) may impact my business	3.7	3.9	4.7

An important consideration is noted for both policy and future industry training. Focus on disaster management is often around significant events – natural disasters and health related disasters – but trips and falls, localized power outages, equipment failure are more likely to influence daily operations of businesses and yet are not considered or understood by operators. Sometime small vulnerabilities within the business may cause chaos and disruption, preventing business as usual and leading to large scale disaster situations if not managed effectively or immediately. These should not be overlooked. Among all participants there is less confidence in understanding the response to smaller disaster events.

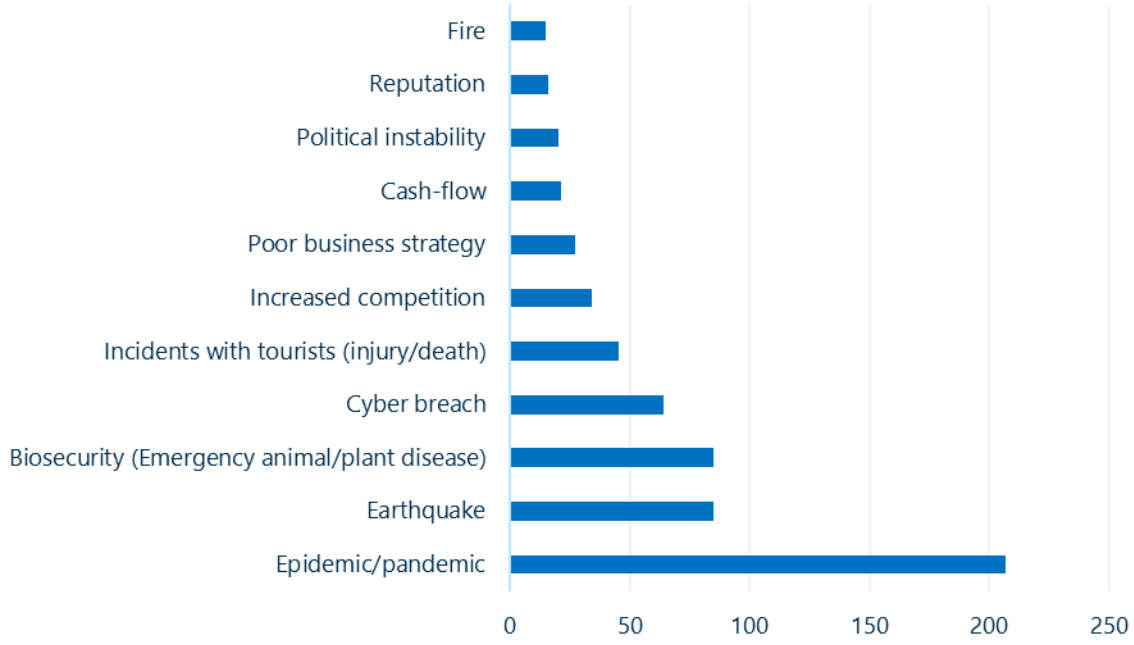
30 https://www.unwto.org/covid-19-measures-to-support-travel-tourism

Identified threats

Respondents were asked to identify the top threats to their business, selecting the top three (Figure 4). Of these, top of mind responses such as epidemic/pandemic and natural disasters such as earthquake rated highly among participants. Societal conflicts, protests and other forms of political instability were also raised as key risks for the tourism industry.

It is interesting to note that whilst more than 5 million people die globally due to extreme heat and heatwaves each year[31], no respondents identified this as a core risk to their business.

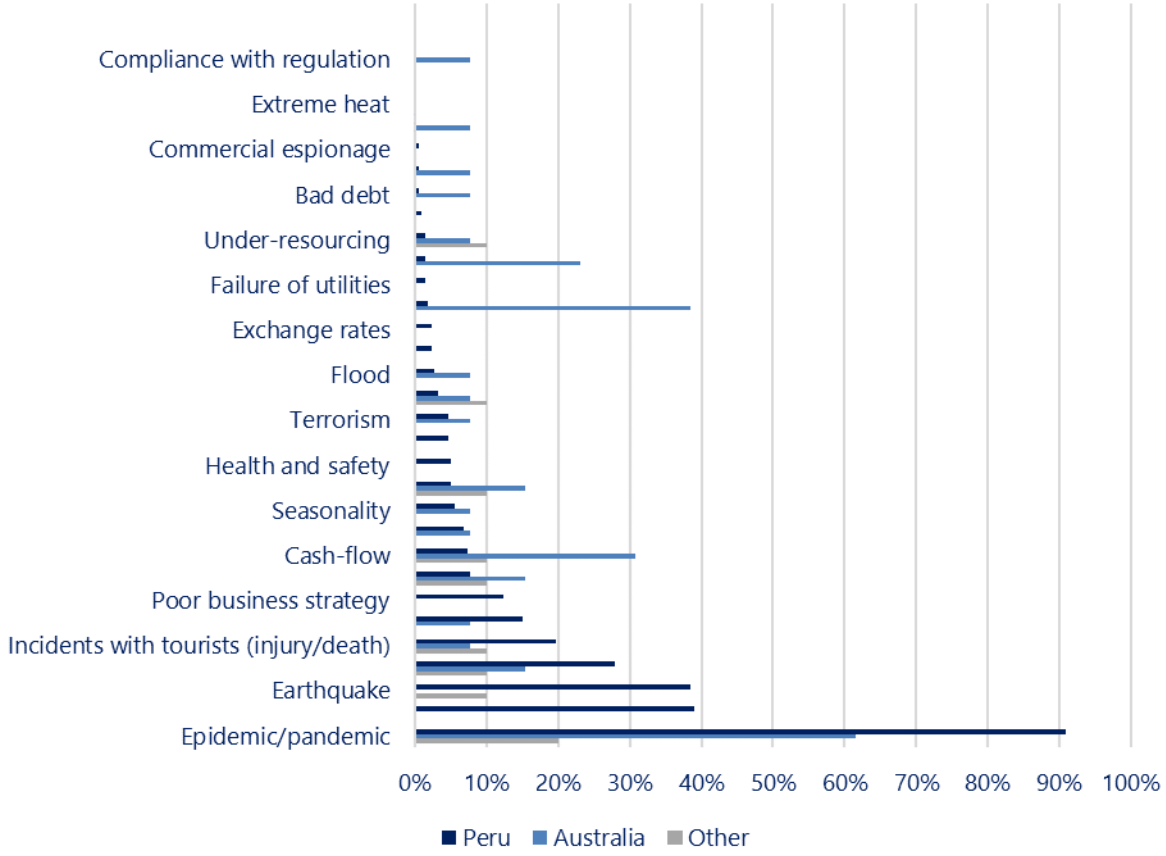
Figure 4 Top threats identified to businesses



When comparing economies in Figure 5, epidemic or pandemic threats rated top across both Peru and Australia, however less prevalently across Australian respondents. Recession and cashflow threats were both of strong concern for Australian respondents.

31 Zhao et al., 2021. Global, regional, and national burden of mortality associated with non-optimal ambient temperatures from 2000 to 2019: a three-stage modelling study. the Lancet Planetary Health. 5.(7). 415-425.

Figure 5 Comparison of identified threats



Among "other" economies including New Zealand, Papua New Guinea, US, Japan, and Mexico (note this is a small sample size and should not be generalizable) respondents identify a mix of natural disasters such as earthquake, fire and floods and man-made disasters such as cash-flow, power loss, incidents with tourists and a lack of human resources as key threats to businesses.

Disaster preparedness

When examining vulnerability through a preparedness lens, 53% of respondents have a crisis management plan in place (Table 6). So, whilst the rhetoric around understanding disaster risk and where their vulnerabilities lie is strong, the actual preparedness of businesses is lower, with more than one third of respondents (37.9%) not having plans in place. A further 9.1% of businesses are unsure whether this plan is in place.

Table 6: Crisis or disaster management plan in place			
	Total	**Australia**	**Peru**
Yes	53.0%	46.2%	53.0%
No	37.9%	53.8%	37.2%
Unsure	9.1%	0.0%	9.8%

A lack of preparedness is a challenge for businesses as often it means a lack of rapid or efficient response when a disaster event occurs. Strengthening the disaster preparedness across all levels of employees is critical to ensure that vulnerabilities of businesses are reduced. The lack of awareness as to whether a plan is in place also indicates vulnerabilities within these businesses. Disaster preparedness should not just sit with the top tier of management. All staff need to be aware of the risks a business faces and how best to minimize and or respond to said risks. A lack of awareness of the plans in place indicates a breakdown in communication and a need for greater accessibility to information. Technology can play a key role in this area.

Exploring emergency evacuation planning, businesses are more prepared (Table 7), 62.3% identifying that they have this in place. However, 33.3% do not have an emergency evacuation plan in place and an additional 4.3% are unsure. Again, this highlights a contrast between awareness of risk and disaster preparedness.

Table 7: Emergency evacuation plan in place			
	Total	**Australia**	**Peru**
Yes	62.3%	69.2%	61.9%
No	33.3%	23.1%	34.4%
Unsure	4.3%	7.7%	3.7%

The Australia respondents indicate that they are slightly more prepared when it comes to evacuation planning than other respondents. This is likely due to state-based policy and requirements for evacuation planning and rehearsals. Commercial entities are required to have evacuation plans within buildings, trained fire wardens and regularly scheduled training sessions. This policy response has a clearly demonstrated impact with a strengthened level of preparedness across businesses.

Less respondents have a business continuity plan in place with only 52.4% (Table 8) with a plan in place, 39.8% without a continuity plan and a further 7.8% unsure whether they have such a plan. Again, this highlights the contrast between risk awareness and *actual* preparedness.

Table 8: Continuity plan in place			
	Total	**Australia**	**Peru**
Yes	52.4%	30.8%	54.0%
No	39.8%	53.8%	38.6%
Unsure	7.8%	15.4%	7.4%

Respondents of Peru appear more prepared for business continuity that respondents from Australia and other economies.

When asked about their online management systems to support disaster response, 52.4% of respondents had a system in place (Table 9), compared to 42.4% of businesses that do not have a system in place.

Table 9: Online management systems to support disaster response			
	Total	**Australia**	**Peru**
Yes	52.4%	15.4%	54.9%
No	42.4%	61.5%	41.4%
Unsure	5.2%	23.1%	3.7%

Tourism businesses in Peru and other economies were far more likely to have online management systems in place than Australian tourism businesses.

When asked about confidence towards the disaster management and resilience landscape, respondents demonstrated some confidence (Table 10). Less confidence was demonstrated among the cohort of respondents from Peru.

Table 10: Business ability to shift rapidly from business-as-usual to respond to a crisis			
	Total	**Australia**	**Peru**
Very confident	13.8%	0.0%	14.4%
Confident	42.2%	69.2%	40.7%
Not very confident	37.8%	23.1%	39.2%
Not confident at all	1.3%	0.0%	1.4%
I have not thought about this before	4.9%	7.7%	4.3%
Mean (out of 4)	**2.72**	**2.75**	**2.71**

The contrast between understanding of how risks will impact the business and the level of confidence in business preparedness indicates business vulnerabilities and the skills required to support a more resilient future. Table 11 further highlights a disconnect on preparedness with 46.2% of Australia respondents and 42.7% of Peru respondents not confident or never have thought about training their senior management and operational teams in business continuity and incident management.

Table 11: Senior management & operational management teams are trained in business continuity and managing incidents			
	Total	**Australia**	**Peru**
Very confident	30.2%	7.7%	30.3%
Confident	24.9%	46.2%	22.9%
Not very confident	32.0%	15.4%	31.7%
Not confident at all	0.9%	7.7%	0.0%
I have not thought about this before	12.0%	23.1%	11.0%
Mean (out of 4)	**2.96**	**2.70**	**2.98**

A significant difference was recorded between continuity planning across premises, technology, knowledge, suppliers, and other stakeholders (Appendix 2). Those in a partnership structure had more confident in the plans and strategies in place than other company structures.

Micro businesses demonstrated significantly more confidence in staff continuity planning (understanding this is defined as 1-5 staff) than small, medium, and large businesses. This is likely due to a clear understanding of resourcing availability and flows. This was the only significant difference identified across different sized businesses regarding disaster preparedness.

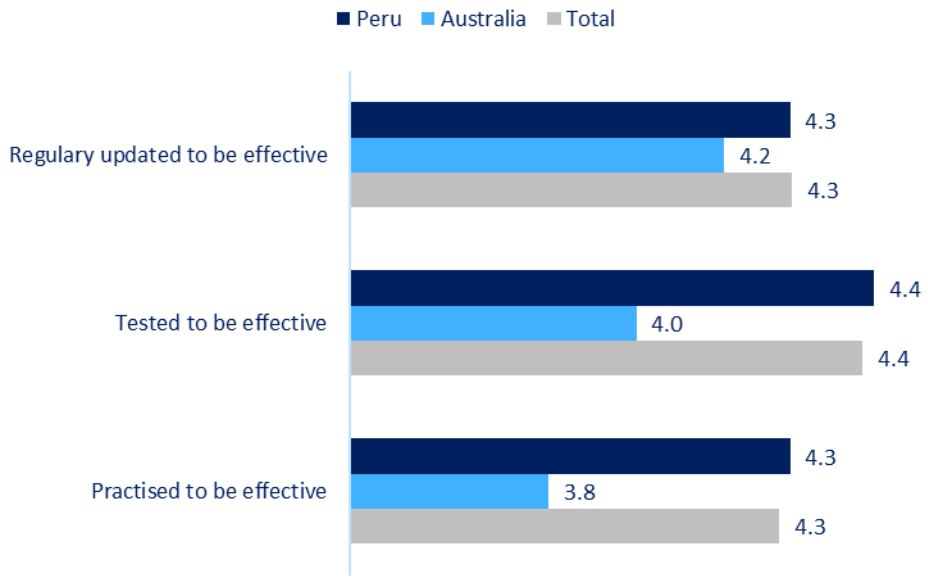
Table 12: Organization has a strong culture that provides direction for staff in a crisis			
	Total	**Australia**	**Peru**
Very confident	19.1%	15.4%	18.3%
Confident	44.4%	46.2%	42.7%
Not very confident	29.3%	7.7%	29.8%
Not confident at all	0.9%	7.7%	0.0%
I have not thought about this before	6.2%	23.1%	5.0%
Mean (out of 4)	**2.87**	**2.90**	**2.87**

Table 12 highlights more than half of respondents from both Australia and Peru believe their organization has a strong culture in crisis management.

Training, rehearsal & continual review

Respondents were asked the extent they agree that disaster management plans need to be practiced to be effective. Of the respondents, 29.3% strongly agree, 66.4% agree and 4.3% neither agree nor disagree on the statement. When comparing economies, there is more confidence among respondents from Peru than other economies in the requirements of updating, testing, and rehearsing disaster management practices.

Figure 6 Training and Rehearsal Understanding



Yet, despite an understanding that regular practice is required to be effective, only 3.4% test twice a year. Of the other respondents 17.7% never test their plans, 18.5% test every two years and 15.5% test every five years. This may leave businesses vulnerable without the necessary capacity to cope and adapt.

Similarly, 98.3% of respondents identify that risk assessments need to be regularly updated to be effective. However, only 2.2% are updating on a bi-annual basis (twice a year). More respondents update annually (41.1%) but given an awareness of the importance of keeping this document relevant, there is a disconnect between intent and action.

Only 14.3% are updating the risk assessment every two years and 12.1% never update their risk assessment. Whilst a total of 19.0% of respondents do not have a risk assessment at all. Given the rapid speed that the global risk environment is changing, this presents a significant weakness among operators. Without understanding what the risks are to their business they are unable to put in place actions to mitigate or effectively respond to such risks. This leaves the business increasingly vulnerable.

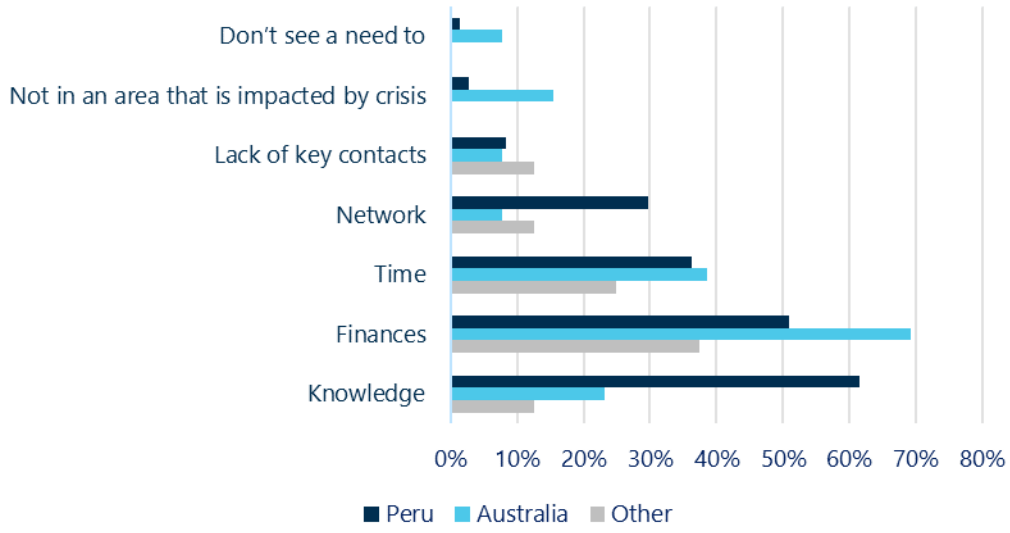
Barriers

Across the range of disaster preparedness barriers typical to MSMEs, knowledge, finance and time were all identified as major challenges (Figure 7). This aligns with several other disaster management studies conducted with tourism businesses and is typical of constraints to MSMEs.

Interestingly, despite the world facing a global pandemic over the past two years, several participants seen in Figure 8 still identified that they are not in an area impacted by crisis and disaster events and that they do not need to prepare for disasters.

Figure 7 Top barriers to disaster preparedness

Figure 8 Comparison of barriers to disaster preparedness



Examining the differences, a perceived cost associated with preparedness and mitigation measures is a core barrier for Australian respondents. In comparison, respondents from Peru are constrained by knowledge. This contrasts with the confidence level in business preparedness, whereby businesses appeared confident, or very confident in the ability to

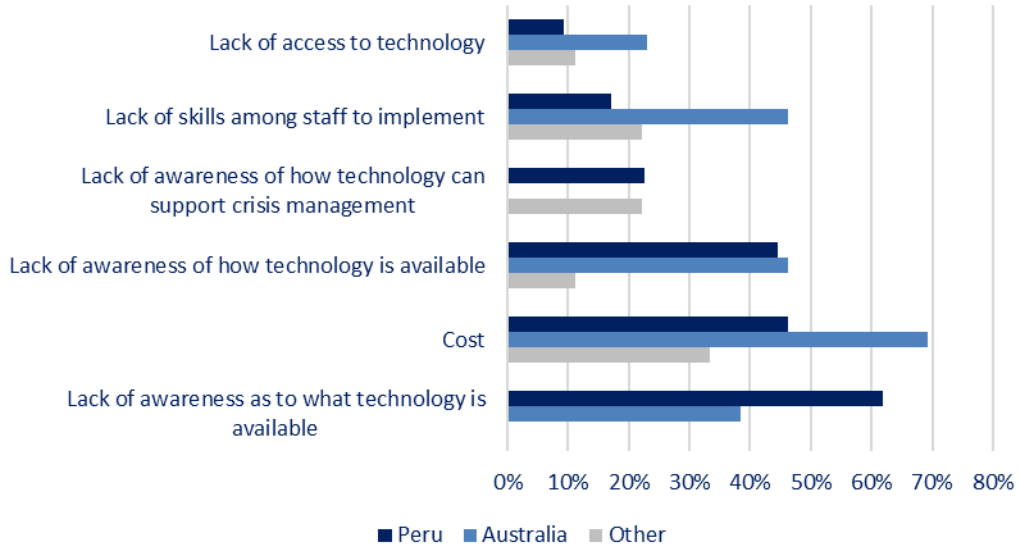
respond to disaster events. For other economies, lack of time, knowledge and finances are all critical barriers that need to be addressed to become better prepared.

When asked to identify key barriers to the use of ICT in crisis preparedness, response and/or recovery, a lack of awareness and skills were the key barriers faced by respondents (Figure 9).

Figure 9 Barriers to the use of ICT in disaster management

In examining differences, lack of awareness is more prevalent among those in Peru, whilst cost, skills and access are larger barriers to those in Australia (Figure 10).

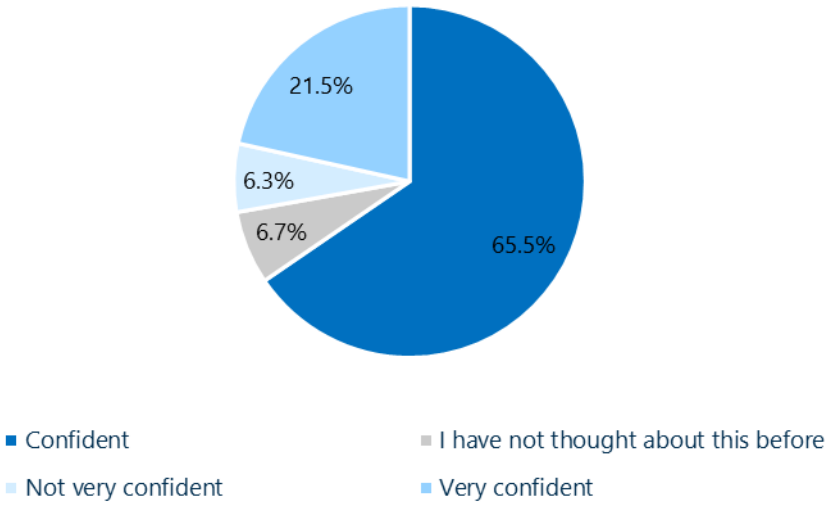
Figure 10 Comparison of barriers to the use of ICT in disaster management



Disaster response

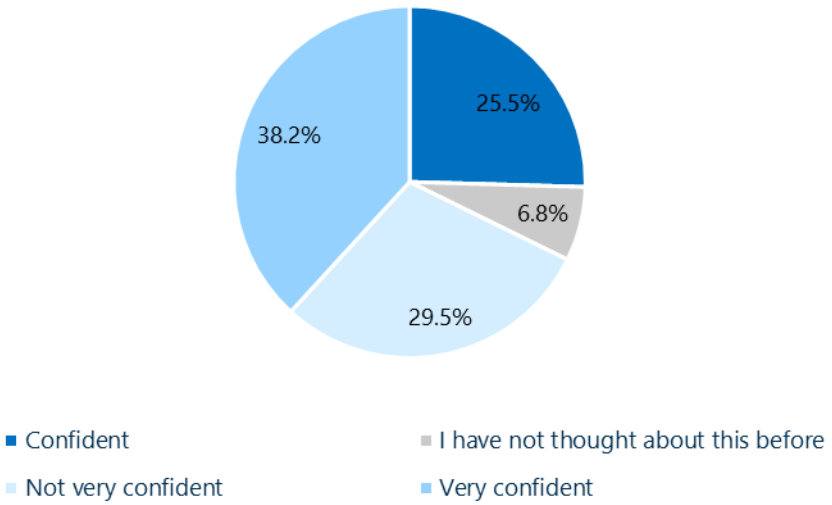
When asked to select the level of confidence to best reflect their business continuity for staff planning in response to a disaster event, 87.0% indicate that they are confident or very confident with their staff's ability to respond. A total of 6.7% of respondents had not thought of staff continuity in response to a disaster and a further 6.3% identify that they are not very confident (Figure 11)

Figure 11 Staff continuity planning in place



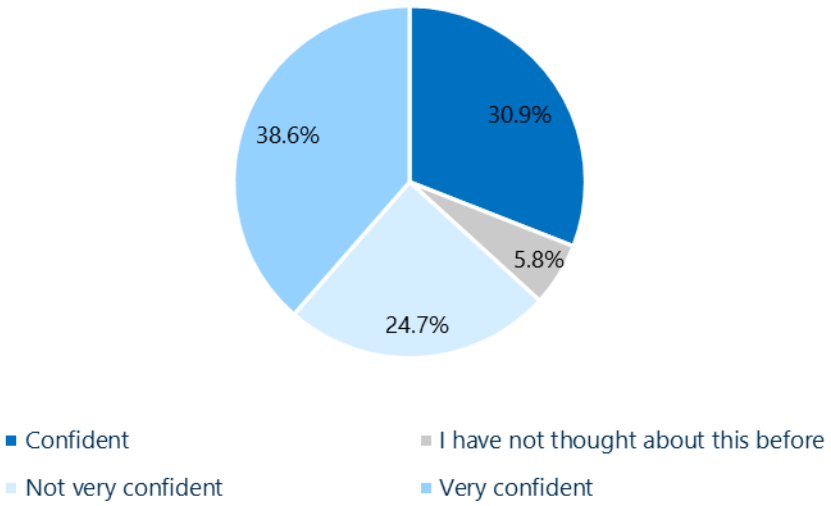
When examining business continuity planning for premises, 63.6% are confident or very confident with the response plans they have in place. Of the respondents 29.5% are not confident at all and 6.8% have not even considered the continuity planning required for their premise (Figure 12).

Figure 12 Premise continuity planning in place



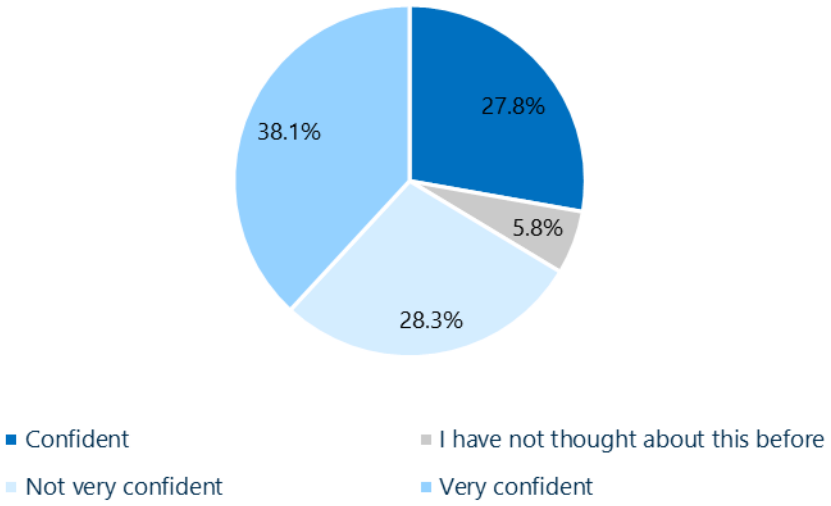
Regarding ICT and technology continuity in disaster situations, 69.5% of respondents are confident or very confident with the response plan they have in place. 24.7% are not very confident and 5.7% have not thought about this before (Figure 13).

Figure 13 ICT and technology continuity plan in place



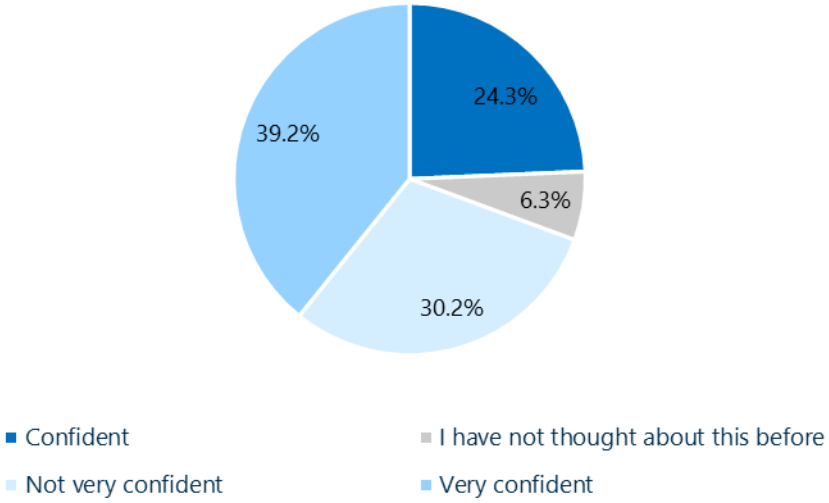
Knowledge management proves to be an area of lower confidence among respondents with 65.9% confident or very confident in their continuity planning response. In contrast, 28.3% are not very confident and 5.8% have not considered how they may manage the loss of key knowledge should a disaster strike their business (Figure 14).

Figure 14 Knowledge management continuity planning in place



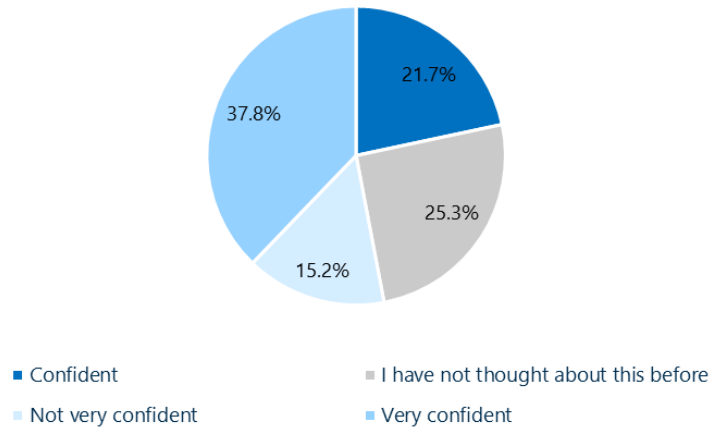
Observing continuity planning arrangements with suppliers, 63.5% of respondents are confident or very confident with the plans in place. 30.2% are not confident at all and a further 6.3% have not considered suppliers at all (Figure 15). Given the complex network of suppliers required to deliver the tourism and hospitality experiences, this is a major challenge and a core vulnerability of the sector that needs to be addressed moving forward.

Figure 15 Supplier management continuity plan in place



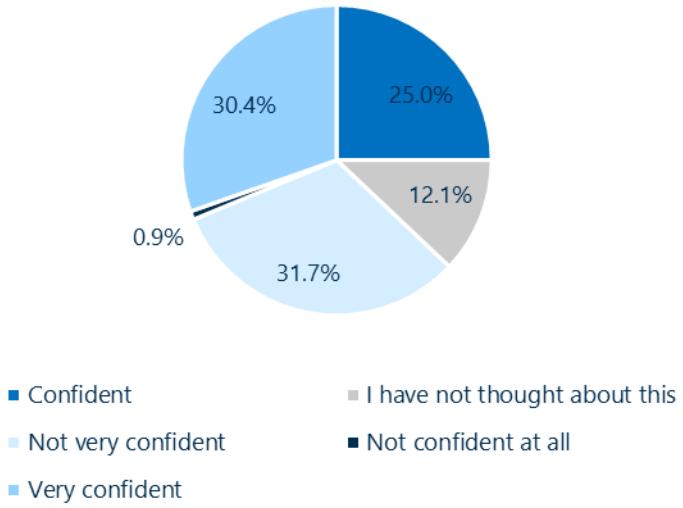
Beyond supplier management, it is understood that tourism relies on a network of stakeholders, from third party sales agents to DMOs to consumers and supporters. Understanding how to deal with each of the stakeholders, how to prioritize response and address challenges is an important stage of disaster response. Of the respondents, approximately one quarter (25.3%) had not thought about planning for other stakeholders and a further 15.2% were not confident in this area. Just over half of the respondents, 59.4% were confident or very confident in their response to other stakeholders (Figure 16).

Figure 16 Planning for continuity with other stakeholders



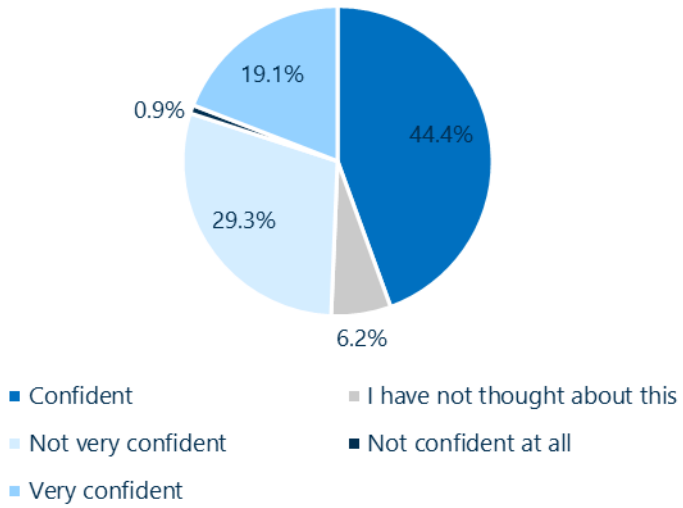
When asked about the senior management's training in business continuity and managing incidents just over half of the respondent (55.4%) are confident in the level of preparedness. Conversely, 32.6% are not confident or not at all confident and a further 12.1% have not yet considered training for disaster management (Figure 17).

Figure 17 Confidence in management disaster management training



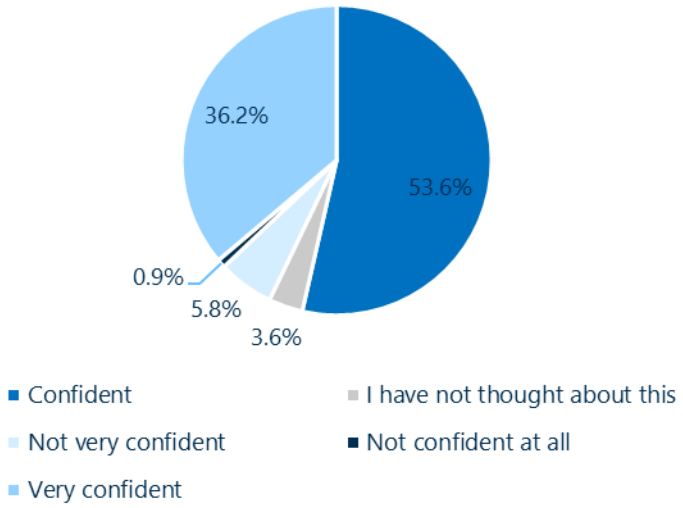
The staff culture around management direction in a disaster situation is quite positive with 63.6% of respondents confident or very confident in the response given. Of respondents, 30.2% were not confident at all and 6.2% had not considered the culture in a disaster situation (Figure 18).

Figure 18 Culture and direction in a disaster situation



Most respondents (89.7%) are confident or very confident that the staff in their organization have the skills and knowledge to respond to unexpected situations.

Figure 19 Staff have the skills and knowledge to respond to unknown situations



In exploring the differences between respondents from Australia and Peru, those from Peru were more confidence in staff skills to respond to unknown situations (Table 13).

Table 13: Staff have the information and knowledge they need to respond to unexpected problems

	Total	**Australia**	**Peru**
Very confident	36.2%	7.7%	38.0%
Confident	53.6%	46.2%	54.3%
Not very confident	5.8%	15.4%	5.3%
Not confident at all	0.9%	0.0%	0.5%
I have not thought about this before	3.6%	30.8%	1.9%
Mean (out of 4)	**3.30**	**2.89**	**3.32**

Yet, in terms of practices in place to respond to a disaster event, Table 14 below, highlights the steps in place to respond and several key practical steps are not in place. A disaster kit (or go-kit) was missing among many respondents. This is an important consideration as it facilitates evacuation of the premises and allows for operation of the business from a remote location. A dedicated media spokesperson was also a gap within many businesses. It is understood that the media are likely to report on a tourism disaster, having a well-trained stakeholder who can transparently engage with the media in an articulate, consistent, and clear way is important in containing and controlling the narrative around a disaster event.

Table 14: Practical steps in place to respond to a disaster event

	Yes	No	Unsure
Policy to back up data	59.3%	38.0%	2.7%
A go-kit ready	8.1%	78.8%	13.1%
Staff contact list up to date	91%	6.3%	2.7%
Staff contact hierarchy	93.6	5.0%	1.4%
Dedicated media spokesperson trained	53.6%	41.9%	4.5%

There is a contrast between the practical readiness between respondents across Peru and Australia as outlined in Table 15.

Table 15: Comparison of practical steps to respond to disaster event

	Yes		No		Unsure	
	Australia	**Peru**	**Australia**	**Peru**	**Australia**	**Peru**
Policy to back up data	84.6%	54.6%	7.7%	38.1%	0.0%	1.8%
A go-kit ready	30.8%	6.4%	46.2%	76.6%	15.4%	11.9%
Staff contact list up to date	61.5%	88.1%	23.1%	5.0%	7.7%	1.8%
Staff contact hierarchy	38.5%	91.3%	46.2%	1.8%	7.7%	0.9%
Dedicated media spokesperson trained	53.8%	50.0%	38.5%	40.4%	0.0%	4.6%

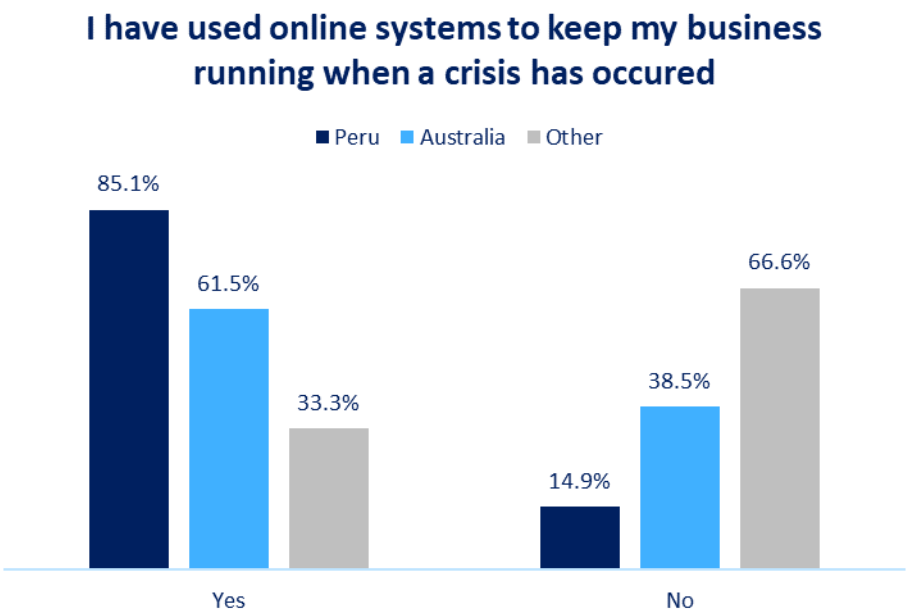
The ability to rapidly shift from business-as-usual to disaster response was significantly different among those in a partnership structure, company limited by guarantee and other structures, with those in a partnership most agile (M=2.5).

When examining the use of online systems to support a disaster response, those respondents from Peru are more likely to have used an online system than those from Australia and other economies.

Newer tourism businesses, those operating for less than four years are also significantly less confident in embedding ICT as part of their disaster response ($P<0.001$).

Yet of the respondents, a total 83.0% have used online systems to keep their business running during a disaster event in the past (Figure 20).

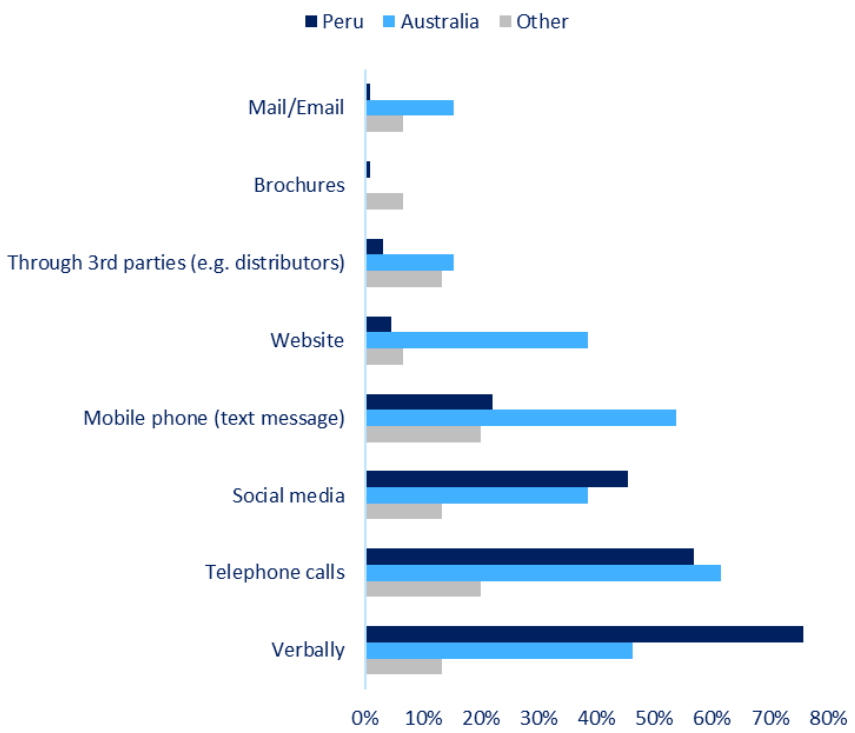
Figure 20 Comparison of the use of online systems for business continuity in disaster event



Business continuity is critical in times of a disaster situation. Processes that drive efficiency in response and recovery are important to support tourism businesses to create cash-flow and get back in business.

Examining how respondents communicate with guests during times of business disruption, verbal, telephone, and social media were predominantly used as communication channels. Highlighted in Figure 21, Australia typically utilizes ICT more effectively, using SMS facilities and websites to communicate to mass audiences in a time-efficient manner.

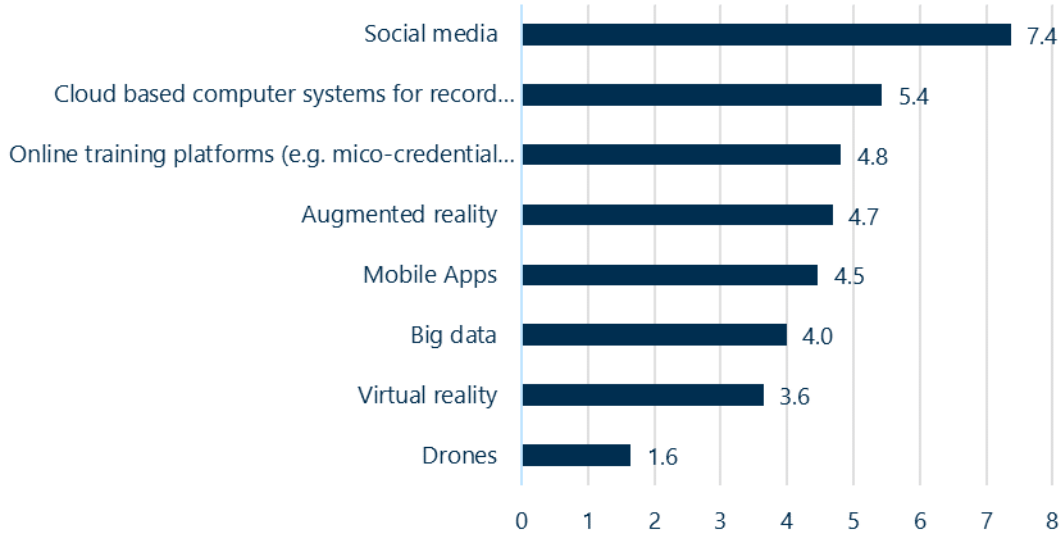
Figure 21 Communication channel in disaster situation



It is evident from this approach that there is opportunity to better utilize technology for more effective engagement with consumers in disaster situations to streamline responses and to assist staff in their management approach.

When asked to rank the most useful technology in times of a crisis as seen in Figure 22, social media, cloud-based computer systems for record holding and online training platforms were identified as top by respondents.

Figure 22 Most useful ICT in times of disaster



Collaboration

Working collaboratively during times of disaster is important to support a coordinated response effort. When asked about working with DMOs respondents noted, 7.3% already have a strong working relationship, 50.9% identified that they can build the relationship whilst 41.8% were either unsure or did not believe that they would be able to work with their DMO in disaster response and or recovery efforts (Table 16).

Table 16: Collaboration with DMO			
	Total	**Australia**	**Peru**
Yes (able to build a relationship)	50.9%	7.7%	52.4%
No	37.3%	30.8%	37.1%
Unsure	4.5%	23.1%	3.3%
Already have a strong relationship	7.3%	38.5%	4.3%

When looking at the opportunity to work collaboratively with Local or State Government of Municipalities (Table 17), 5.4% already have existing relationships, 53.6% believe they could build effective working relationships and 41.0% were unsure or do not believe that they could work effectively with this stakeholder.

Table 17: Collaboration with Local or State Government			
	Total	**Australia**	**Peru**
Yes (able to build a relationship)	53.6%	46.2%	53.8%
No	38.3%	15.4%	39.5%
Unsure	2.7%	23.1%	1.4%
Already have a strong relationship	5.4%	15.4%	3.3%

At a government level, relationship building is more complex, 0.9% of participants hold an existing relationship and 51.1% indicate that they believe that they would be able to work effectively at this level in disaster response and recovery efforts (Table 18).

Table 18: Collaboration with Economy Level Government			
	Total	**Australia**	**Peru**
Yes (able to build a relationship)	51.1%	38.5%	51.0%
No	38.5%	30.5%	38.6%
Unsure	9.5%	30.8%	4.8%
Already have a strong relationship	0.9%	0.0%	3.3%

When it comes to other tourism operators, it is expected that there is more confidence in the ability to collaborate. 10.3% of respondents identify existing relationships and 59.4% note an ability to build relationships in disaster or crisis events. A total of 30.4% of respondents were unsure or believe they will be unable to work collaboratively with other operators should an event occur (Table 19).

Table 19: Collaboration with other tourism operators

	Total	**Australia**	**Peru**
Yes (able to build a relationship)	59.4%	23.1%	61.4%
No	29.5%	23.1%	30.0%
Unsure	0.9%	7.7%	0.5%
Already have a strong relationship	10.3%	46.2%	7.1%

Examining connections with other suppliers in Table 20, 8.6% of operators already have strong connections and a further 55.5% of respondents were confident they could build relationships in times of disaster. Of the respondents, 35.9% were either unsure or do not believe that they would be able to work collaboratively with suppliers during a disaster or crisis event, again highlighting vulnerabilities across the tourism supply chain.

Table 20: Collaboration with other suppliers

	Total	**Australia**	**Peru**
Yes (able to build a relationship)	55.5%	30.8%	55.7%
No	31.8%	7.7%	32.9%
Unsure	4.1%	23.1%	2.9%
Already have a strong relationship	8.6%	38.5%	5.7%

Resources

In looking at the practical steps to respond to a disaster situation and the resources required to keep a business functioning post-disaster, the major concern for operators is financial resources with only half of the respondents considering that they would have enough financial resources to continue operations (Table 21). Other vulnerabilities exist with the physical resources with 31.8% of operators unsure whether they would have the required resources to respond and recover.

Table 21: Availability of resources to respond and recover

	Yes	No	Unsure
Human Resources	86.6%	8.0%	5.4%
Financial Resources	51.1%	43.9%	4.9%
Technological Resources	69.5%	6.3%	24.2%
Physical Resources	56.2%	12.0%	31.8%

Tourism's understanding of broader disaster management techniques and use of ICT was also assessed. There was limited confidence in ICT in disaster response and the types of responses that are already used by other sectors highlighted in Table 22. This aligns to key barriers of knowledge and awareness.

Table 22: Use of ICT in disaster response

	Very confident	Confident	I have not thought about this	Not very confident	Not confident at all
Big data mapping of high-risk areas	39.7%	15.1%	28.8%	14.6%	1.8%
Drone operators for crisis recovery	8.1%	8.1%	45.2%	35.7%	2.7%
Early warning systems in place	39.7%	19.2%	11.4%	28.8%	0.9%
Use of ICT in crisis response	41.6%	16.9%	5.9%	35.2%	0.5%

There is a significant difference between medium and micro businesses knowledge of big-data mapping of high-risk areas, with medium businesses significantly more confident (P=0.01) of big-data mapping in response to disaster events (M=3.8), when compared with small (M=2.1) or micro (M=2.2) businesses.

Understanding the local context and the local community, when it comes to knowing where the emergency facilities are, Table 23 below highlights the confidence of operators.

Table 23: Understanding of local emergency facilities					
	Very confident	**Confident**	**I have not thought about this**	**Not very confident**	**Not confident at all**
Emergency services	48.2%	21.6%	1.4%	28.8%	0.0%
Medical facilities	48.2%	20.0%	1.8%	30.0%	0.0%
Federal Gov. operations	18.1%	11.8%	32.6%	36.2%	1.4%
Neighborhood safe places	41.8%	13.5%	7.6%	37.1%	0.0%

There is also a significant difference between micro, small and medium businesses confidence in the location of emergency and medical facilities (P=0.01). In both cases, micro businesses (M=2.5 & M=2.2) are significantly more confident that small (M=1.4 & M=1.4) and medium (M=1.7 & 1.7).

Table 24 examines how businesses have built a culture of disaster management within their business. Among respondents, there is a gap within tourism businesses when it comes to considering risk management and disaster preparedness. Approximately one third of respondents are not engaging their staff in the disaster management processes and systems and a similar number do not believe that they have the knowledge required to effectively handle hazardous situations.

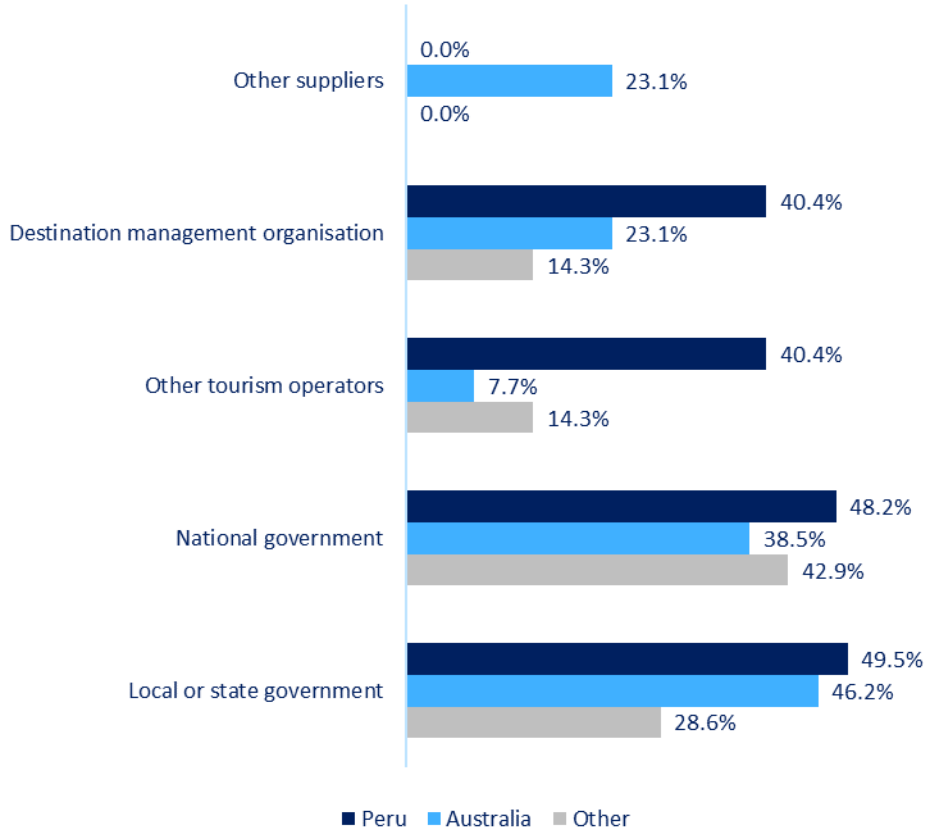
Table 24: Understanding culture of disaster management in business					
	Very confident	**Confident**	**I have not thought about this**	**Not very confident**	**Not confident at all**
Building a culture of prevention and preparedness	23.7%	40.6%	9.1%	26.5%	0.0%
Integrating resilience into disaster plans	23.9%	37.2%	8.7%	30.3%	0.0%
Having pre-disaster trainings / simulations	41.6%	25.3%	5.4%	27.6%	0.0%
Having sufficient knowledge on hazard management	41.6%	26.9%	2.7%	28.8%	0.0%
Clear lines of responsibility	42.9%	27.4%	3.7%	26.0%	0.0%
Regular staff trainings	39.7%	21.5%	6.4%	32.0%	0.5%
Evacuation drills	41.1%	27.9%	5.5%	24.7%	0.9%

There is also a significant difference between micro, small and medium businesses in the building of a culture of prevention of preparedness and prevention (P=0.007). Micro businesses (M=2.5) are significantly more confident in this area than other small businesses (M=1.6) and medium business (M=2.2). This highlights the locus of control within micro businesses and the ability to embed principles of disaster prevention and preparedness across a business.

There are also significant differences between micro, small and medium businesses in the approach to integrating resilience into disaster plans (P=0.033) and the establishment of clear lines of responsibility (P=0.038). Whereby small businesses are significantly less confident in the integration of resilience in disaster plans (M=1.8) when compared to medium (M=2.4) and micro (M=2.5) businesses. Similarly, small businesses (M=1.4) are significantly less confident in the lines of responsibility that exist than micro businesses (M=2.2) and medium businesses (M=2.4).

When it comes to seeking further support, a range of other stakeholders could be engaged including peer support and government support (Figure 23).

Figure 23 Support required to enhance disaster preparedness



Implications

Understanding that vulnerability is the

> *propensity, sensitivity, or susceptibility to be harmed or adversely affected whilst lacking the capacity to cope or adapt - IPCC*[32]

results from the surveys collected across tourism operators within the APEC economies have highlighted several vulnerabilities within the tourism sector and across all aspects of disaster management.

Disconnect between intent and action

Whilst operators understand the implication of risk they may face during disaster events, the reality is many MSMEs do not have practices in place to support preparedness, prevention, response, or recovery efforts. This disconnect between intent and action presents a vulnerability and a lack of capacity among operators.

Results also indicate a group of operators who believe that they are not in a risk prone area or that their business will not be impacted by disasters, this may in part be due to the narrative and language used. Despite a global pandemic and other natural disasters impacting tourism at the time of this survey, results indicate the Australian businesses surveyed had a lower level of understanding of their disaster risk whilst research tells us:

> *As the global temperature rises and other changes to the climate increase, Australia will face more frequent and severe events, such as extreme weather, fires and floods, and slow-onset events, such as changing rainfall patterns, ocean acidification and sea level rise – B. Norman*[33].

There is no time to waste in adapting and taking immediate action to better prepare for disaster events.

Businesses need to put in place the structures and systems to support their staff in understanding and identifying risk. To know how to reduce risks, respond effectively, build capacity to cope or to adapt. Without these systems, structures, and policies in place, it is implicitly assumed that staff have the knowledge, skills and capabilities to deliver on these outcomes. When it comes to disaster management, this is not a risk worth taking.

32 IPCC. (2014). Summary for policy makers. In C. B. Field, V. R. Barros, D. J. Dokken, K. J. Mach, M. D. Mastrandrea, T. E. Bilir, M. Chatterjee, K. L. Ebi, Y. O. Estrada, R. C. Genova, B. Girma, E. S. Kissel, A. N. Levy, S. Maccracken, P. R. Mastrandrea, & L. L. White (Eds.), *Climate change 2014: Impacts, adaptation, and vulnerability*, 4-6. Cambridge University Press. [Google Scholar]

33 Norman, B. (2022). The floods have killed at least 21 Australians. Adapting to harsher climate is now a matter of life or death. https://theconversation.com/the-floods-have-killed-at-least-21-australians-adapting-to-a-harsher-climate-is-now-a-life-or-death-matter-https://theconversation.com/the-floods-have-killed-at-least-21-australians-adapting-to-a-harsher-climate-is-now-a-life-or-death-matter-178761

Policy implications – risk management planning should become a prerequisite for grant and funding support to all business. As part of this measure, operators should have review measures in place for regular and on-going analysis of changing environmental conditions. Communication channels to staff should also be clearly embedded within the documentation to ensure all staff are aware of the core risks to the business and how to respond.

Industry leadership – disaster management has not been considered mainstream within tourism and hospitality. This needs to change. Disaster and risk management must become a business-as-usual conversation. Industry needs to be reminded regularly to complete analysis of risk, to take steps to mitigate some of their risks and to communicate and train their team in disaster response. An industry wide culture change is needed to achieve this.

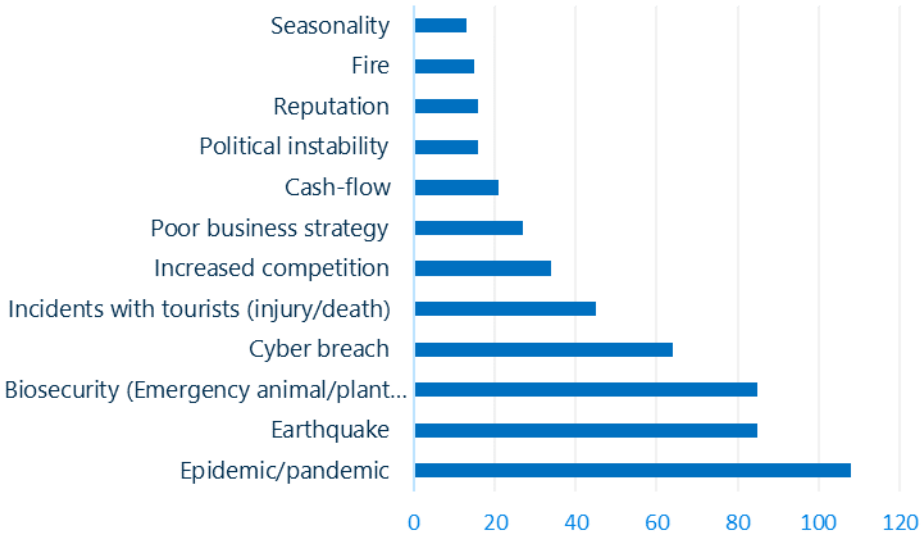
ICT efficiencies – opportunities exist to enhance efficiencies across disaster risk awareness through software usage in planning and monitoring risks and in training systems to support capacity building for operators.

Risk perception

Research indicates that often there is a difference between people's risk perception and actual risks[34]. For example, Japan experienced a heatwave in 2019 resulting in 18,000 heat related hospitalizations[35], yet heatwave was not identified as a key risk among respondents. Similarly, the economy was one of the most impacted by flood, yet this was not identified as a key risk by operators.

In Peru, nearly half of the population has been impacted by floods, droughts, forest fires, earthquakes, landslides, or volcanic eruptions between 1990 and 2002[36]. Yet, of these, only earthquake and fire risk rate within the top concerns for tourism operators (Figure 24).

Figure 24 Peru respondents top risks identified



For New Zealand operators, where the pandemic has closed all international borders and natural disasters such as earthquakes, increasing temperature and rainfall variability are significant risks[37], respondents noted cash-flow, incidents with tourists and under-resourcing as some of their major challenges.

To address our vulnerabilities and build resilience, we must understand where our vulnerabilities lie. For tourism businesses, pressing challenges within their businesses are different, leading to differencing perceptions of risk and addressing different vulnerabilities at varying levels.

Part of this challenge may be around the language that is used; the interchanging use of risk, disaster, vulnerability, resilience, challenge and many other variants may cause

34 Garvin T (2001) Analytical paradigms: the epistemological distances between scientists, policy makers, and the public. Ri Analy 21(3):443–456. https://doi.org/10.1111/0272-4332.213124
35 GLOBAL CLIMATE RISK INDEX 2021 Who Suffers Most from Extreme Weather Events? Weather-Related Loss Events in 2019 and 2000-2019. https://reliefweb.int/sites/reliefweb.int/files/resources/Global%20Climate%20Risk%20Index%202021_1_0.pdf
36 World Bank. Advancing Policy Reforms in Peru to Reduce Risks from Natural Hazards. 2021. https://www.worldbank.org/en/results/2021/11/05/advancing-policy-reforms-in-peru-to-reduce-risk-from-natural-hazards#:~:text=Nearly%20half%20of%20the%20country's,disasters%20between%201990%20and%202020.
37 New Zealand Government. (2021). Climate Change for Primary Industries. https://www.mpi.govt.nz/funding-rural-support/environment-and-natural-resources/climate-change-primary-industries/

confusion across the industry. A consistent approach to expressing how businesses adapt to the changing conditions that they face is critical to simplify the discussion, make it accessible to businesses at all levels of understanding and develop trust across the system.

Accessibility of knowledge is also critically important. For some MSMEs knowing where to look for key information on risks may not be clear. When comparing among length of trading period, it became evident that awareness and knowledge of risk is something that is built in businesses over time. That those businesses that are new to operations are at a disadvantage and need to establish fresh context and knowledge. There needs to be additional support to new tourism businesses to engage them with a broader understanding in the risk context prior to commencing trade.

Building knowledge, awareness and skills from an early age should also be considered as a core part of curriculum development not only in tourism but across all education pathways.

Policy implications – for economy, or regional, risk priorities, awareness, building and support measures must be distributed across the tourism network with a particular focus for new tourism businesses.

A consistent message around core risks and mitigation techniques supports a consistent approach to reducing the associated risk.

Education pathways should include a focus on risk management, understanding economy specific and localized risks, and disaster management techniques should become a soft skill embedded in the curriculum.

Industry leadership – disaster management is a collaborative activity and specific to communities. Sharing technical capacity, knowledge and resources can bring collective benefits across the tourism industry. Supporting collective capacity building workshops to understand risks, document, and trial a plan creates a common foundation point.

ICT efficiencies- utilizing ICT to support knowledge sharing could provide an ease of access to resources and a single-entry point for operators. As previously mentioned, capacity building opportunities can be leveraged through online platforms. Utilizing on-demand modules reduces barriers such as time and cost, creating an ease of entry for time and resource poor operators.

Risk management processes

The lack of capacity to act or do something about the risks and threats faced by business is a clear cause of vulnerability. Setting systems, processes, and procedures to manage risk, reduce risk, respond to disaster events and reflect and evaluate post-disaster is recognized as a way of reducing vulnerabilities. Yet, a large proportion of businesses do not have the systems in place. Or, if these systems are in place, staff members are unaware of what they are and how to enact them, causing confusion and creating additional vulnerabilities.

Policy implications – a shift in narrative is required to engage all businesses with a disaster resilience narrative that aims to build capacity and systems and reduce vulnerabilities.

Investment in soft skill development is needed. This includes adaptive capacity to ensure that all staff can respond effectively to changing conditions.

Disaster risk reduction and resilience should be embedded as part of destination management plans at regional and economy levels. This should be more than a brief mention but provide key performance indicators to support action across industry.

Industry leadership – showcasing systems, processes and programs that support tourism businesses mitigate, respond to, or recover from, disaster situations through case-studies and marketing efforts presents the opportunity for peer-to-peer learning. Exploring the opportunities that exist through real-life application of solutions, risk assessments, mitigation techniques, management plans and response checklists can strengthen understanding across networks. Case-studies can be developed and distributed digitally through static readable documents, video studies, micro-credentials or in hard-copy books[38] and journal articles.

ICT efficiencies – a plethora of existing templates and guides already exist to support operators with disaster risk reduction, mitigation efforts and planning processes. These could be supported through a centralized portal. Virtual case-studies could provide interactive peer-to-peer learning and support opportunities to build a culture of resilience across the tourism network.

38 Cotterell D., Gardiner S., Novais M.A., Montesalvo N., Westoby R. (2022) Decision-Making in Times of Crisis: Bringing Back Binna Burra Post bushfire. In: Sigala M., Yeark A., Presbury R., Fang M., Smith K.A. (eds) Case Based Research in Tourism, Travel, Hospitality and Events. Springer, Singapore. https://doi.org/10.1007/978-981-16-4671-3_23

Supply chain challenges

A challenge for respondents is the connection with suppliers. Coordination and collaboration are critical for sustainability, success, and the long-term resilience of an organization[39]. Approximately one third of operators had not considered continuity arrangements with suppliers during disaster situations. Localized supply-chains are often easier to control and have proven to be more resilient within a disaster situation, but often tourism operators will rely on overseas suppliers due to pricing advantage. Given the complex network of suppliers required to deliver the tourism and hospitality experiences, this is a major challenge and a core vulnerability of the sector that needs to be addressed moving forward.

Policy implications – governments should support the fostering of local supply chain and request multi-stakeholder funding applications to build collaborative approaches. Guidance and support for businesses is required as an interim measure to build knowledge and understanding in how to engage locally to reduce challenges across supply chains.

Industry leadership – regular assessment of supply chains and evaluation of alternative suppliers will position operators for continuity in volatile and uncertain times.

ICT efficiencies – mobile applications, tracking programs and supply-chain management programs support organizations to create sustainable supply chains, to reduce supply chain risks and to manage their impacts more effectively. In a post-disaster environment, consideration should also be given to response efforts and access to technology to support speed of recovery.

39 Santanu Mandal,Ritesh K. Dubey. (2020). Role of tourism IT adoption and risk management orientation on tourism agility and resilience: Impact on sustainable tourism supply chain performance. International Journal of Tourism Research. 22. (6). 800-813.

Collaboration

Effective and effortless collaboration is required in pre- and post- disaster management to support tourism operators in reducing vulnerabilities and enhancing resilience. Research highlights that effective collaboration builds organizational learning, creates cost-savings and can provide additional resources to organizations[40]. Coordination and collaboration should be supported by harmonized policymaking that reduces the duplication of responsibilities, creates clear budgeting for disaster management and supports capacity building for the sustainability of destinations. To promote collaboration across the tourism network, trust and clear communication is required along with shared norms and values.

Policy implications – creating a policy environment that supports a collaborative approach is essential. Depending on the culture of the network government may need to take a facilitating or a supporting role in strengthening and promoting the collaboration across the network. There is the opportunity to provide a guiding role in the delivery of capacity building and the strengthening of networks; supporting tourism operators to activate networks that compliment disaster management goals and collective needs.

Industry leadership – proactive engagement with partners, suppliers and other stakeholders within the destination will strengthen the approach to disaster management and aid disaster response. Understanding resource availability across the network, including skills will enable operators to provide a more directed disaster response and recovery effort.

ICT efficiencies – there is ample opportunity for tourism to utilize ICT to build, strengthen and maintain its networks.

40 Sapat A, Esnard A-M, Kolpakov A. Understanding Collaboration in Disaster Assistance Networks: Organizational Homophily or Resource Dependency? *The American Review of Public Administration*. 2019;49(8):957-972. doi:10.1177/0275074019861347

Enabling infrastructure

Whilst only raised by a small number of respondents, having adequate infrastructure is critical to embed ICT as part of a disaster response. The WEF *Global Risks Report 2022* highlights the exacerbation of inequalities and consequences of polarized connectivity, education and income trajectories further fragmenting the global economy.

Other disaster resilience infrastructure, such as insurance is also key to building resilience. Yet is becoming more challenging for operators to obtain or in many cases afford. Innovative new approaches to insurance (such as RediCova[41]) are shifting the marketplace and making insurance more accessible. However, challenges still exist in destinations globally and for MSMEs with activities deemed "high risk".

Policy implications – understanding gaps in infrastructure is critical to provide seamless access to business and community. Intervening with enabling ICT infrastructure is one of the main ways that governments can engage in tourism[42].

Industry leadership – supporting advocacy efforts to reduce network gaps and inefficiencies will remove remaining barriers around access to digital infrastructure and support a connected disaster response. Advocacy to support MSMEs obtain affordable insurance options that provides adequate coverage is also required.

41 RediCover. (2022). https://redicova.com.au/how-it-works/
42 ADB. (2021). Sustainable Tourism after COVID-19: Insights and Recommendation for Asia and the Pacific

Resources

It was evident that businesses face challenges with financial, human resource and technical limitations. Access to and understanding of disaster and risk data is limited in such circumstances, while risks have differential impact on different MSMEs. These limitations have an implication on risk management strategies that such MSMEs can resort to and the practical solutions that business will be willing to engage in.

Research indicates that in some economies risk transfer and financing options remain a challenge due to unaffordable and inflexible insurance options[43]. Consequently, informal financing and business savings are required for response and recovery efforts, leading to significant challenges for businesses.

Policy implications – transforming tourism requires effort at all scales from local through to economy-wide level. Within that decision making process, all groups should be represented to ensure that resources are appropriately disseminated and that policies support all stakeholder groups.

Industry leadership – investment in upskilling of staff to meet the challenges being faced is now a matter of priority. Whether shared collaborative resources in region; dedicated internal resources; or several team-members with awareness and understanding of disaster risk and management practices; the investment is vital.

43 UNDRR. (2019). Business Resilience of Micro, Small and Medium Enterprises. https://www.preventionweb.net/files/69379_reporttechnicalconsultationonbusine.pdf

Understanding ICT

A barrier for engagement with the use of ICT in disaster mitigation, response and recovery is a lack of knowledge. There are two clear paths to this.

First, a lack of awareness around other sectors' use and engagement with ICT in disaster preparedness, prevention, response, and recovery. This was especially prevalent among newer tourism businesses, again highlighting the need for additional support for this cohort. By not seeing the broad use application of ICT, operators are not always aware of the challenges that ICT can support. Investment into understanding the future of technology for the tourism industry was conducted by the Queensland Tourism Industry Council in 2019 with the support of the State Government[44]. Investment in upskilling in digital capacity was identified as having numerous benefits for industry including increasing tourism economic activity, competitiveness, addressing capacity issues through skills shortages, addressing challenges, and promoting career opportunities.

Second, a lack of skills and knowledge within their own internal team was also identified as a barrier. This means that even if there is awareness of the opportunity, capacity limits mean that tourism operators will be unable to utilize technology to its full extent within the organization. There may also be further misconceptions around financial outlays associated with embedding technologies within the organization that cause further barriers to engagement.

Now is the time to build capacity across industry. Knowledge was identified as a key barrier to engagement with ICT and disaster management principles. Having just experienced a global pandemic and with the world experiencing a number of other climatic and political related events, now is the time to invest in education and capacity building to enhance skills, build capacity and reduce vulnerability.

Policy implications – sector data sharing between government, private independent business owners and market research companies can support a broader knowledge base of market ready initiatives that can solve existing challenges. Capacity building programs to support skill development is also a critical need. Capacity building also needs to be considered in future thinking and adaptive pathway management toencourage adaptive response to new disasters.

44 Queensland Tourism Industry Council & Griffith Institute for Tourism. (2019). Digital Workforce Development & Training Plan. https://qticazure.blob.core.windows.net/crmblobcontainer/Queensland%20Tourism%20Digital%20Workforce%20Plan.pdf

Tools available to reduce vulnerabilities

There are a plethora of tools, guides, and manuals available for businesses and other tourism stakeholders to respond to and prepare for disaster situations. A number of the tools that are available, although not designed specifically with the tourism industry in mind, can be directly applied to tourism's response to the changing conditions. These tools are ready to be promoted immediately to support industry with a small example list highlighted in Table 24.

Table 24 Tools for disaster and risk management

Category	Description	Area of disaster management
ISO31000 Risk management guidelines	Using ISO 31000 can help organizations increase the likelihood of achieving objectives, improve the identification of opportunities and threats and effectively allocate and use resources for risk treatment.	Preparedness & prevention
Think Hazard	Identify natural hazards in your project area and understand how to reduce their impact.	Preparedness & prevention.
Sustainable Tourism After COVID-19 – Insights and Recommendations for Asia and the Pacific report	The report highlights six pathways for promoting systemic change in the sector. It provides concrete recommendations on how policymakers and industry stakeholders can leverage tourism to foster sustainable development and a green recovery.	Response & recovery.
General climate information	Climate data and projections of change	Climate Change in Australia Global Climate Knowledge Portal
Managing Risk: A New Framework – Harvard Business Review	This framework presents a categorization of risk that allows executives to understand the qualitative distinctions between the types of risks that organizations face.	Preparedness & prevention.
Risk assessment and resilience building	Tools for different stages of risk planning	AdaptNRM by Department of Environment, CSIRO and NCCARF
Adaptation planning	Helps identify climate impacts, vulnerabilities and adaptation options	Adaptation Scotland (for businesses)
Coastal risks, inundation and sea-level rise	Coastal adaptation planning, inundation maps, sea-level rise	CoastAdapt by NCCARF Coastal Risk Australia by the Cooperative Research Centre for Spatial Information (CRC-SI) Coastal Management Plan – QLD Government

Category	Description	Area of disaster management
		SLR with Vertical Land Movement for Cities by ClimSystems
Flood management	Provides access to flood studies conducted all over Australia	Australian Flood Risk Information Portal by Geosciences Australia Watershed data NOAA Sea Level Rise Viewer
Specific risks to business/infrastructure	Risk reduction for resources and buildings	Climate Institute Risk to Infrastructure NCCARF- Infrastructure planning
Australian Disaster Resilience Handbook Collection	Highlights and promotes the adoption of good practice in building disaster resilience in Australia	Preparedness and resilience.

In addition to the generic resources outlined above, several resources have been developed for the tourism industry. It is understood that often tourism operators are overwhelmed by the amount of material available to support them. With so many options available, it is unclear where to begin or which of the support materials will provide the most value. For many operators there is also an issue of time, having work through so many options can be frustrating and overwhelming. When it is not a priority focus area for some business, the extensive search requirements may mean that the process gets put on hold. Making quality information as accessible as possible is important in strengthening business resilience.

Table 25 has examples of quality tools and resources developed for the tourism industry.

Table 25 Tourism specific resources for risk and resilience

Name	Description	Aspect of disaster management
Crisis Resource Centre - PATA	A public resource aiding in the rapid, robust, and responsible renewal of the Asia Pacific Travel and Tourism Industry. PATA's Crisis Resource Center (CRC) was developed to help destinations recover from the COVID-19 crisis and prepare them for future crises that will come. The end goal is to help build a more resilient tourism industry.	Preparedness, response and recovery
Hotel Resilient Online Learning	Strengthening the capacity of hotels and resorts to manage risks and improve preparedness from climate-related and other natural and technological hazards.	Preparedness.
Samoa Tourism Authority: Tourism Technical Guidelines for Climate Resilient Practices	These technical guidelines accompany the TDA Management Plans which describe the strategic direction for building resilience for tourism operators and their reliant communities. This document presents a series of guidelines as a 'toolkit' of options that are available to increase resilience to climate change risks, and as far as possible preserve the top attributes for tourism and overall community wellbeing.	This document provides guidance on building design and siting, on water efficiency and erosion control, and other aspects of resilience.
Sustainable Hospitality Alliance 2016: Hotel Water Management Initiative (HWMI)	HWMI is a tool to enable hotels to measure and report on water use in a consistent way. HWMI is free of charge and can be used by any hotel anywhere in the world, from small guesthouses to 5-star resorts.	Water efficiency and conservation
Sustainable Hospitality Alliance 2013: Water Risk Assessment	This tool is designed to enable easy uptake of information. Frameworks that summarize key risks, impacts and responses are also provided as an overview of the essential information. In addition to the literature included in the reference list, further reading sources can be provided on demand.	Water efficiency and conservation
EarthCheck: CrisisReady	CrisisReady is an evolution of the Ready, Set Go! mobile app, created by EarthCheck, QTIC and the Commonwealth Government. It is designed to assist Queensland tourism businesses prepare for and recover from disasters.	Disaster preparedness, response, and recovery.
Risk Management Toolkit	The risk management toolkit helps managers, administrators, and boards to develop and implement a risk management strategy. "Risks are uncertain future events that could impact on the organization's ability to achieve its objectives"	Disaster preparedness.
Disaster Plan Template for Community Organisations	This Disaster Plan Template is a resource from the Resilient Community Organizations website (http://resilience.acoss.org.au). It is a starting point for community organizations developing a Disaster Plan.	Disaster preparedness
PATA: Crisis Resource Centre	The PATA Crisis Resource Centre is a unified platform that provides reliable and up-to-date policy statements, authoritative information, and tourism indicators from around the globe. The aim of the Centre is to provide a global centralized repository of reliable information for users based on their needs.	Disaster preparedness, response, and recovery.
Tourism Australia: Don't Risk It	This guide assists tourism businesses to prepare, respond and recover from a crisis.	Disaster preparedness, response, and recovery.
No arriesgues tu negocio Sura & EarthCheck	The Don't Risk It kit and tourism assets have been translated into Spanish with key partner insurance company Sura to support tourism operators to prepare for, respond to and recover for disaster. Guía para ayudar a las empresas turísticas, a prepararse,	Preparedness, prevention, response & recovery.

Name	Description	Aspect of disaster management
	responder y recuperarse de una crisis.	
Japanese Tourism Agency	An app to support tourists. This app provides disaster information to international visitors. The Japan Tourism Agency launched the app in October 2014 with the aim of achieving an environment in which international visitors can travel around Japan with a feeling of greater security. It provides push notifications of Earthquake Early Warnings, Tsunami Warnings, Weather Warnings and Eruption Notices. In addition, there is an evacuation flowchart that shows what evacuation behaviors are required for the given conditions, a communication card that can be used to obtain information from Japanese people, and useful links that provide information in times of disaster.	Disaster response.

Next Steps

The tourism industry is vulnerable to disaster events. Natural and man-made disaster events are recognized by the industry as significant challenges. How vulnerable are MSEMs to these disaster events?

Despite a confidence in understanding how they will impact the business, there is still a lack of preparedness, especially among small businesses and businesses that have been operating for less than four years. According to Forbes, only about 50% of businesses make it through the first five years[45], giving them the best chance of success through building resilience will help reduce vulnerability.

Barriers to preparedness are similar to previous research findings: a lack of knowledge, resources and time prevent business engagement in reducing vulnerabilities and building capacity to adapt. Understanding these challenges is key to reducing vulnerability, enhancing capacity, and building resilience. Knowing that time and finances are also barriers, providing a cost effective, on-demand model is important that tourism business owners, managers and team members can access anytime, anywhere at a reasonable price-point. Training should first raise awareness of core risk relevant to the destination but then build on prevention, preparedness, response and recovery strategies and frameworks, as well as tried and tested models that will support operators to set the structures they need in place. ICT offers a cost effective and broad reaching approach to delivery.

Similarly, a lack of knowledge is seen as a key barrier to implementation of ICT in crisis response. Firstly, knowledge of solutions and secondly of skills within the team. Building skills and capacity across both these areas is also important to strengthen the approach to engagement with ICT. Simple solutions are required and over time as skills and knowledge are built so to can the complexity of the technology implemented.

Continuing to think of disaster risk, resilience, and vulnerabilities across MSMEs in the same way we always have needs to shift. The same approach to management is not building capacity. Taking a systems-based approach and reducing network vulnerability may support a nuanced approached to the tourism system that builds community capacity in a different way. Considering utilizing ICT as a connector across the system, building capacity that supports, and connecting skill gaps across the network may enable tourism systems to build skills and knowledge over time. However, it also draws on the capacity that they need at the time from the local networks they are connected to.

The next phase of this project focuses on solutions to the challenges outlined in this report, support the reduction of vulnerabilities and the development of capacity within the tourism industry to embed ICT in disaster response to build and strengthen resilience. A

45 Otar. (2018) What Percentage Of Small Businesses Fail -- And How Can You Avoid Being One Of Them?. Forbes. https://www.forbes.com/sites/forbesfinancecouncil/2018/10/25/what-percentage-of-small-businesses-fail-and-how-can-you-avoid-being-one-of-them/?sh=1859a48843b5

forward focused implementation strategy will explore a systems-based approach to embedding ICT strategies to support MSMEs in disaster preparedness, prevention, response and recovery in order to reduce their vulnerabilities.

PHASE 3 – LESSONS LEARNT & RECOMMENDATIONS

Phase 3 – Introduction

This final phase of the report will bring together the analysis of global best practice, the primary research to provide recommendations, and next steps to build tourism operator resilience to enhance the positioning of MSMEs when it comes to disaster preparedness, prevention, response, and recovery.

By identifying where tourism systems and businesses are vulnerable, MSMEs can strengthen their approach to disaster management and build resilience. Disaster resilience is the ability of a system to absorb the distractions and adapt when there is turmoil to grow and become more dynamic. The research outlined in Phase 1 highlights that there is an inequality in disaster management and a direct correlation between poverty and vulnerability. This is often due to limited access of resources, knowledge, and opportunity. This Phase aims to highlights policy and practical opportunities to reduce vulnerabilities and build resilience across economic divides. These risk reduction strategies will provide a scale of opportunity that build capacity across MSMEs and are designed to stimulate disaster preparedness.

Lessons Learnt

The global insights demonstrate a plethora of studies, research, and practical interventions to support disaster preparation, prevention, response, and recovery efforts at a local economy and even multinational level.

The following section overviews the lessons learned from the global insights augmented through the primary research conducted with 300 tourism MSMEs across APEC economies, that can be easily adopted to the tourism sector to support MSMEs to enhance disaster preparation to build resilience.

Duplication of resources

Across the global research, it became evident that there is a duplication of resources and efforts into disaster preparedness and prevention for communities and businesses. Well-meaning organizations are investing millions and sometimes billions of dollars to strengthen disaster resilience without coordination between agencies, programs, projects, and outcomes. This leads to duplication of resources, cross-over of programs, replication of ineffective program and a lack of real outcomes that are driving change.

A lack of awareness of investment overtime seems to impact the strategic intent of enhancing the preparedness of communities. Whilst there is an overall gratitude for the support of major investment, care must be taken to ensure that outcomes are real and creating values to communities.

To be most effective, policy levers can be adopted to promote protocols and ensure that grant funding is used to maximize outcomes to businesses and communities with outcome driven key performance indicators. Investments into disaster prevention, preparedness, response, and recovery should be done so strategically and aligned to broader goals and strategies for sectors. Stand-alone projects must demonstrate value and real outcomes that enhance readiness to face disaster situations. Programs should be assessed on how they shift attitudes and behaviors to create real change.

International funding bodies provide much needed investment support to deliver major outcomes. Often these bodies hold a wealth of existing knowledge and resources based on similar projects completed globally. Rigorous evaluation of global programs across similar economies would support an understanding of replicability rather than repetition or duplication where processes or programs are less successful.

For tourism, there is much to benefit from sharing of knowledge and resources. Where the industry is comprised of MSMEs it is challenging to find suitable resources to deliver

meaningful outcomes. Stronger network sharing of successful strategies would lead to a more resilient global travel network.

Lack of preparedness

Typical across MSMEs globally is a lack of preparedness for the changing climatic conditions and the impact that this is having on the prevalence and severity of disaster events. Furthermore, there is a disconnect in the perceived risks and the actual risk threating MSMEs in the tourism industry. Recognized vulnerabilities of MSMEs within this research project were ill-aligned to the scientific research of broader risks impacting communities. Suggesting where there was some preparedness for situations, these are not always the most likely or the risks that will have the most significant impact on MSMEs. As the severity and impact of disaster events continue to worsen, it becomes more important that businesses are better prepared for the events that are likely to impact them and able to respond to any disaster situation – big or small.

> *Most respondents instead expect the next three years to be characterized by either consistent volatility and multiple surprises or fractured trajectories that will separate relative winners and losers. – Global Risk Report 2022*

Short-term pressures will make it harder for governments to focus on long-term priorities and will limit the political capital allocated to global concerns. It is timely for businesses to take resilience and preparedness into their own hands, to ensure the long-term viability of their business, community, and industry sector.

To achieve business resilience, a shift is required towards a new narrative around disaster preparedness for MSMEs. Corporate success is increasingly reliant on resilience, adaptability, and continual improvement. McKinsey argues that risk culture needs to be improved and that resilience needs to be embedded through the strategy process. Risk governance also needs to be revisited to better understand the critical role that the risk function plays within an organization[46]. To achieve this outcome, disaster management can no longer be a reactive action, rather needs to be a strategic task with reporting and strong corporate capability. Whilst this intent seems directed for large corporate entities, for MSMEs similar principles must apply. A shift from a reactive approach to disaster management to resilience, proactive planning and training will support MSMEs build resilient capacity and strengthen the future of the tourism industry.

The first step towards proactive planning is building awareness of the type of disaster events likely to impact businesses. Interestingly, this study highlighted that a number of MSMEs are as unprepared for small scale "daily" incidents as they are for natural disasters. Understanding risks of all sizes, the likelihood and impact of the disruption will support MSMEs to better prepare for the type of events that will cause disruption to cash-flow and the reputation of their organization.

46 McKinsey. 2022. From Risk Management to Strategic Resilience. https://www.mckinsey.com/business-functions/risk-and-resilience/our-insights/from-risk-management-to-strategic-resilience

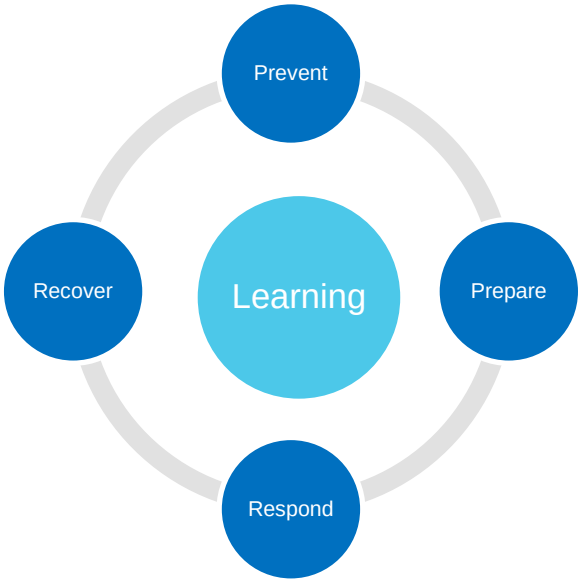
Regular training or on-going scenario training is also important for MSMEs as disaster situations do not happen all the time. Tourism is inherently reliant on a diverse workforce often employed on a casual basis and with a high level of turn-over. Organizational forgetfulness, a lack of training, or a new team require inductions and clear communication to ensure each staff member understands their roles and responsibilities when it comes to responding to a disaster event.

Foundations first

No level of sophistication can help you when the foundations are not in place.

Whether ICT or paper based, first it is integral that the basic knowledge and understanding of disaster preparedness and management is in place. Understanding risk, reducing risk, planning for how to respond and training team members. Once the fundamentals are in place, MSMEs can build on the level of skills and integrate more sophisticated adaptation methods to build resilience.

Figure 25 Disaster management process



Access to essential products, level of reliance on other suppliers and stakeholders, and the infrastructure of the MSMEs all influence and impact vulnerability, preparedness, and resilience. Experience with similar events, level of knowledge, and the network of support are also critical for building the learnt responses and strengthening MSME understanding and awareness of what to do pre-, during, and post- event.

Research indicates that the level of economic means also has an impact on vulnerabilities of MSMEs[47] – low economic performance reducing capacity to adequately respond to disaster situations and creating cascading impacts that cause long-term impacts for businesses, owners, and communities. The foundational knowledge, support, and

47 Australian Institute of Disaster Resilience & CSIRO. (2018). Approach, methods and results for co-producing a system understanding of disaster https://publications.csiro.au/rpr/download?pid=csiro:EP187363&dsid=DS16

preparedness across all areas of the economy is therefore critical to build resilience and reduce impact, especially among the more vulnerable communities.

If information is not available for MSMEs, poor decisions, or no decision will be made regarding disaster prevention, preparedness, response, and recovery efforts. Intervention is required to strengthen MSME capacity.

As tourism is often viewed as a juvenile sector, information dissemination is not as strong through the tourism industry as it is to more mature sectors of the economy. This can lead to knowledge gaps whereby operators may become unsure of how to prepare for or respond to the challenges they face. Low preparedness impacts response rate, wellbeing, and the ability to effectively recover. Building a strong platform of preparedness is important across MSMEs.

Targeted preparation of materials to support MSMEs to build their ability to prevent, prepare for and manage risks and to make accurate and informed decisions on how to respond to a disaster situation is critical step toward reducing vulnerabilities.
Based on the primary research targeted support materials could be prioritized as follows:

1. Dealing with daily disasters – how minor crisis events impact businesses and how businesses can better prepare.
2. Political crisis, the impact on MSMEs and how businesses can prepare.
3. Cybercrime – what does it mean for MSMEs?
4. Natural disaster management – preparing for the unknown.

Whilst there was an overall confidence in financial disaster management, observed patterns suggest that MSMEs are challenged by strategic financial management through economic downturns. Whilst this is not top of mind for MSMEs, support materials should be provided to build the knowledge and reduce vulnerabilities.

The challenge identified through the research is a perceived lack of time and resources (financial and human) among MSMEs to build the required knowledge and subsequently put in place the systems required to better prepare for disaster events. Often it is seen that MSMEs will trade-off disaster preparedness for other business management requirements (or business survival)– working in their business rather than on the business. These trade-offs are shaped by current and historical influences, available knowledge and societal priorities and expectations, alongside the organizational values. To enhance knowledge and shift disaster management to a business-as-usual conversation, more MSMEs may be engaged in disaster prevention and preparedness actions. Access to knowledge needs to be accessible and simple to ensure that any trade-off adds value to the organization.

Digital barriers and opportunities

As ICT is a critical focus of this study regarding supporting MSMEs in reducing vulnerabilities and building resilience, it is also important to highlight challenges with cybersecurity and uneven adoption of technology.

The WEF *Global Risks Report 2022* highlights that during the global pandemic cyberattacks became more frequent with attackers taking advantage of the shift from office work to working-from-home.

Whilst larger organizations were able to swiftly adapt, strengthening their defense systems, inequalities were seen with MSMEs that were economically impacted by COVID-19. The OECD highlights that MSMEs continue to lag larger organizations in the adoption of all forms of digital technology[48]. Cost and knowledge were raised through this study as significant barriers.

As we continue to look to ICT as a solution to the challenges we face, to build the resilience and reduce vulnerabilities of MSMEs, it is also important to consider the threats associated with this response. In building capacity of disaster preparedness, capacity will also need to be built among MSMEs in cybersecurity threats as well as the opportunities and efficiencies that can be achieved through the adoption of ICT.

Another challenge faced by several MSMEs is access to digital infrastructure. High-speed internet and wi-fi networks are not available in all destinations creating adoption barriers. In a disaster situation, when relying on technology to support the disaster response and recovery efforts, access to reliable infrastructure becomes a foundation. Without access to the right infrastructure MSMEs become disadvantaged.

Skills and knowledge were also highlighted through this study as core barriers to adoption of more digital support mechanisms. Time and resources then deter engagement in capacity build initiatives. Shortened training sessions are recognized as adding most value to MSMEs, delivering pertinent knowledge in a timeframe that matches MSMEs expectations.

48 OECD (2020). Tourism Trends and Policies 2020. Preparing tourism businesses for a digital future. https://www.oecd-ilibrary.org/sites/f528d444-en/index.html?itemId=/content/component/f528d444-en

Leadership

The person in control of a group, economy, or situation

To support MSME engagement with disaster preparedness and to reduce vulnerabilities, strong leadership is required. This is the core of good governance. Consideration needs to be given at both an organizational and a government level.

Organizational leadership –

Competencies of leaders are tested in disaster situations. While knowledge and established protocols of action are essential, they must also be innovative and adaptable directing the course of action with the evolution of the event. Core traits of intelligence, empathy, self-awareness, persuasion, and the ability to manage others are looked for in challenging times.

Leaders create the organizational culture within MSMEs and the mandate for embedding disaster resilience. *Resilient Community Organizations* in the six steps of resilience suggests leaders create a mandate for preparedness action (Appendix III).

Policy leadership –

The findings of the research highlight not only the need for strong internal leadership among MSMEs, but clear policy direction required to support organizational resilience.

Research into disaster resilience in Australia highlights that whilst knowledge is important, it does not guarantee change in practice, often due to a challenge with cultural norms[49]. To create impetus for change and to stimulate real action, leadership is required at a policy level to support drivers of change among MSMEs or to incentivize action.

Collaboration & coordination –

Disaster management is not something that can be conducted in isolation. The tourism sector is part of a broader network of stakeholders that deliver the visitor economy and create communities. Coordination and integration across sectors organizations and policy domains can support consistency, coherency and delivery of synergies and efficiencies network wide.

49 Owen, C, Scott, C, Adams, R & Parsons, D. (2015). Leadership in crisis: developing beyond command and control. https://resilience.acoss.org.au/the-six-steps/leading-resilience/leadership-for-disasters-and-emergencies

Accept that nature is our teacher not our enemy and we will always be subordinate to her wishes.

Tools to support decision making in uncertain environments

Reducing vulnerability first comes with understanding the risks that face a destination and business. Once these have been identified, MSMEs can explore immediate and longer-term strategic actions to reduce vulnerabilities and risk, while building resilience.

Research indicates the value in scenario testing and running drills to prepare for disaster situations, yet this was rarely completed by respondents – anecdotal evidence suggesting a lack of time as the major barrier. Global examples highlighted the value of technology and embedding disaster simulations from a young age to create a culture of disaster preparedness.

Building on this concept, embedding disaster management as a core part of tourism and hospitality training should be considered into the future. Curriculum at vocational and university level requires introduction to core concepts and foundational understanding of disaster management. Not only will this reduce business vulnerability, but also community vulnerability with a broader based understanding of core management principles.

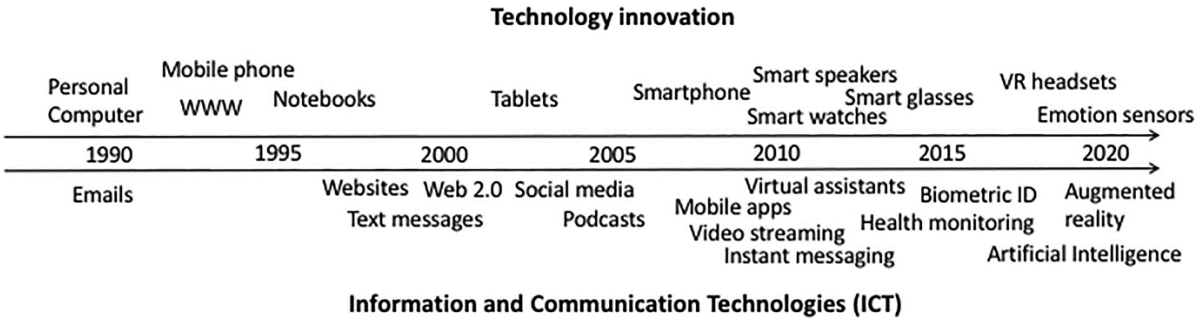
Opportunities to embed technology as part of this training could enhance scenario-based learning. Like the schools' example in Japan, training schools could use virtual reality scenarios to respond to the risks most likely to impact specific destinations. Building capacity and training the leaders of tomorrow with practical skills and knowledge.

For those already operating within the tourism and hospitality industry, the primary research indicated a comfort level with online training platforms. Utilizing on-demand training systems, micro-credentials or webinar-based trainings, tourism operators will be able to access the knowledge required to embed disaster management into their business without the barrier of large costs and time. Two key barriers identified in the research as blocking engagement.

The Use of ICT in the Future of Disaster Management in Tourism

Digital technology and ICT have changed the way that tourism businesses do business. Innovation over the past 30 years has been rapid and shaped efficiencies across MSMEs[50]. Figure 26 highlights the evolution of technology and ICT.

Figure 26 Technology innovation



Familiar technology

Starting with an entry point that MSMEs are familiar with provides opportunity to create efficiencies, build knowledge and start to build a digital disaster management platform.

Through Phase Two of this study, it was identified that operators have the highest level of comfort with social media platforms, websites, and online training platforms.

Utilizing these platforms as the starting point, several potential opportunities are available to build operator capacity, develop efficiencies and start to create a digital disaster management platform.

Social media

There are both positives and negatives of utilizing social media in the context of disaster management. Phase One research highlighted successful adoption of social media platforms to warn visitors in disaster situations. However, Australia has found that there is often rapid spread of misinformation through social media in disaster situations. Thus, it is not the ideal medium for communication. It also relies on active internet connection and a

50 Gossling, S. (2020). Tourism, technology and ICT: a critical review of affordances and concessions. Journal of Sustainable Tourism. 29. (5). https://doi.org/10.1080/09669582.2021.1873353

smart phone or computer, thus creating barriers to accessing information and exacerbating inequalities.

Social media is however, widely accepted and utilized by MSMEs and tourism operators. Rather than utilizing this form of ICT during disaster response, building a strong community for disaster prevention and preparedness is an opportunity. Through moderated groups, networks of operators can share insight, knowledge, and solutions to risk reduction and to set systems that work effectively in disaster situations. Moderation is an important consideration to ensure that information shared is accurate and that misinformation is not harming MSMEs. Platforms create networking opportunities where the sharing of more than just knowledge can occur. Operators can also share resources creating connections that extend beyond the digital world.

A further opportunity for utilizing social media is with disaster recovery efforts. The crowd sourcing at Binna Burra demonstrates that MSMEs can galvanize loyal followers to support recovery efforts. Whilst crowd sourcing should not replace adequate insurance coverage and cash-flow management . Australia's bushfire emergency in 2019 saw $51million raised in crowd-sourcing efforts. Learnings from this include ensuring that there is a clear pathway for the money to go where it can make the most impact. Where there are loyal visitors, support can in instances be rallied, but MSMEs need to apply this technique with caution and note that their broader community may be suffering or in recovery as well.

Text messages

Like social media, a form of ICT that MSMEs are confident with is text messaging services. A relatively "old" form of ICT that is compatible with most mobile devices making it accessible to a broader reach than social media that is only accessible through smart phones and computers. Local Government's across Australia have adopted a text message early warning system for extreme weather events. These are opt-in services that pulse information to individuals when there are extreme storms, hail, cyclone, flooding etc. Whilst the system has identified flaws, in particular its reliance on timely information from the Bureau of Meteorology, it provides cost effective communication to a large population base in a short timeframe.

Figure 27 Text message alert early warning system – disaster response

Websites

Phase Two also highlighted the comfort of MSMEs with the use of websites. A strong example of how websites can be used to strengthen disaster preparedness and to reduce vulnerabilities include the Australian Institute of Disaster Resilience – Knowledge Hub[51] where guides and handbooks are provided for businesses and community members.

On a more technical level, the Think Hazard [52] site provides insight into the type of natural hazards that are most likely to impact a destination (location). This type of website provides support in disaster prevention as MSMEs build an understanding of the risk profile of their business.

DMOs can play an important role in disaster management support from MSMEs. One of the biggest challenges for MSMEs is sorting through the plethora of existing resources and information to find tools and materials that are relevant and engaging. DMOs are trusted advisors for MSMEs. By utilizing these websites as a place to store best practice disaster management support materials and guides barriers to engagement will be reduced.

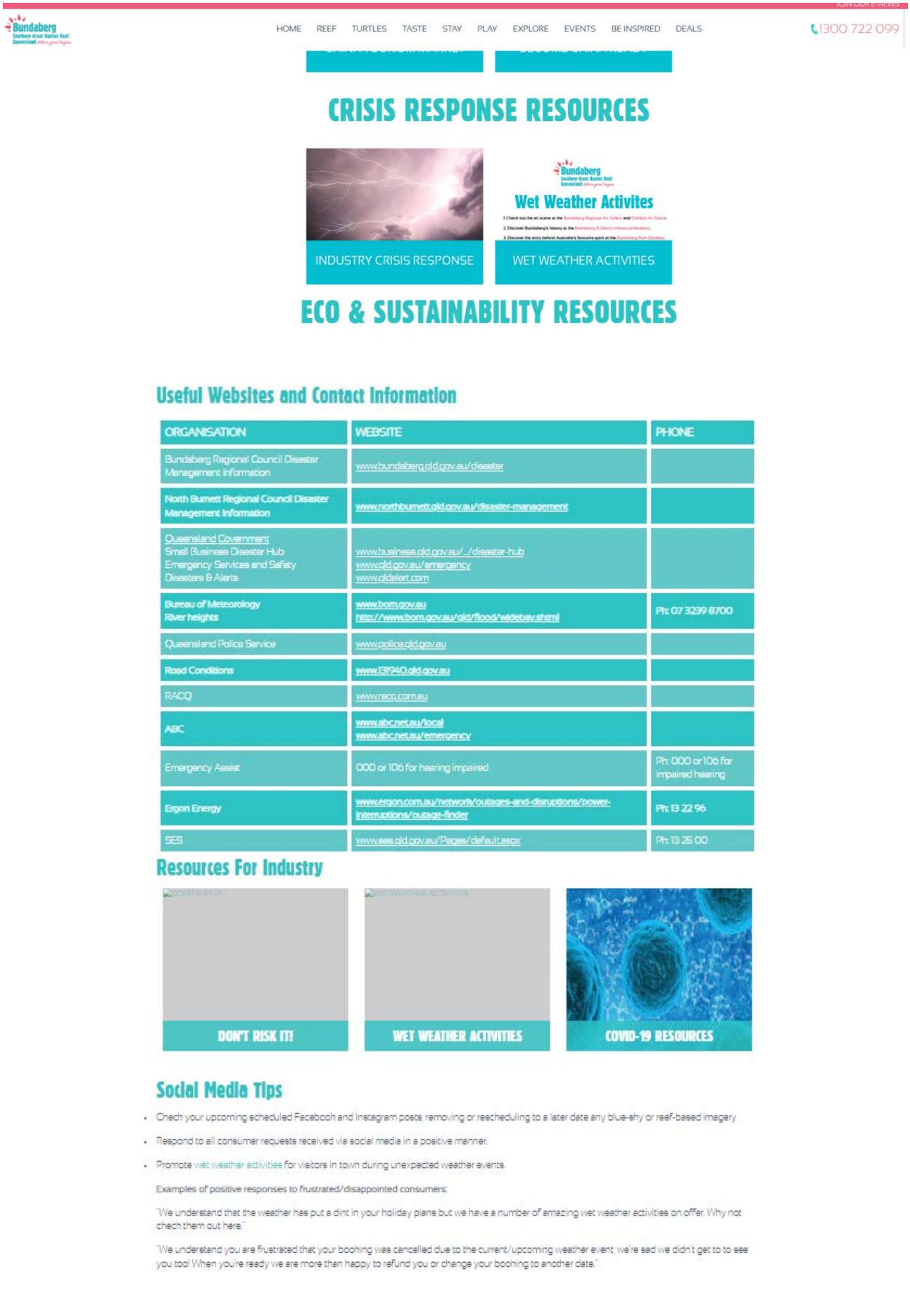
Bundaberg Tourism in Queensland hosts support materials for its tourism operators on its corporate website[53]. Through the provision of templates, contacts and guides, the DMO is emphasizing the importance of disaster management as a business-as-usual activity and leading by example.

51 https://knowledge.aidr.org.au/

52 https://thinkhazard.org/en/

53 https://www.bundabergregion.org/corporate/member-resources#crisis-response-resources

Figure 28 Bundaberg Tourism DMO Website



Online training platforms

The global online learning market is estimated to be worth USD $375 billion by 2026 with the USA owning approximately 34% of the market[54]. The impacts of COVID-19 saw a rapid increase in online learning. University or college students are the primary market in online training with corporations a close second. By 2017, 16.8% of the online learning market for corporations was based on business and management courses. Roughly 78% of businesses globally engage in online learning.

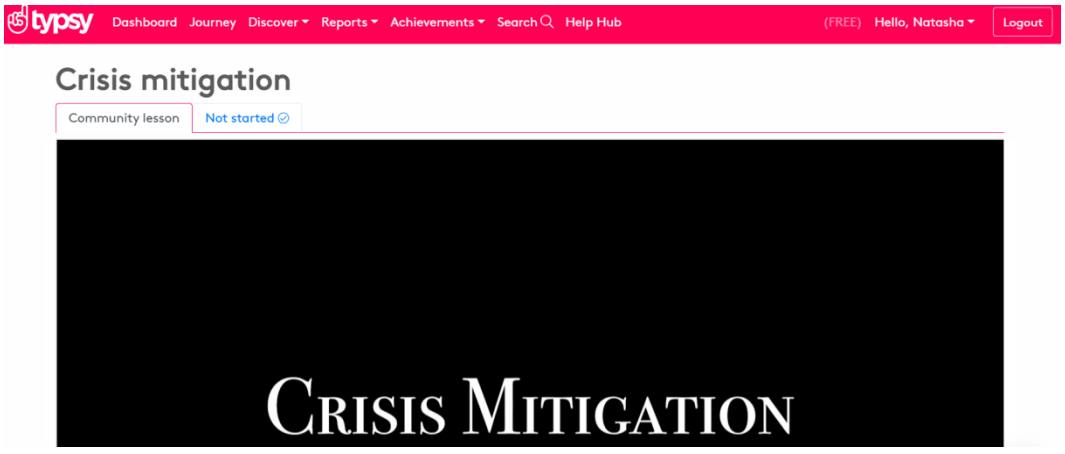
With such a prevalence and growth of online training, there is a comfort and familiarity with these systems among business owners and employees. This was noted through the phase two research. Opportunities exist for online disaster management courses to support MSMEs to build knowledge, skills, and capacity.

Approaches to online training vary from multi-day-course, facilitated workshops on one end, to short micro-credential courses with three to four minute lessons that break up complex topics for operators.

Whilst the multi-day courses do not address barriers such as time and funding to committing to disaster management, the micro-credential courses are on-demand enabling MSMEs to access content at their own convenience in a time and place that suits them. Micro-credentials are often more cost effective than multi-day facilitated workshops as pre-recorded content is a mass consumption offering rather than a tailored approach.

Platforms such as Typsy [55], offer tourism and hospitality focused micro-credential content led by industry experts. The platform currently has a "Crisis Mitigation" lesson available for MSMEs to engage with. There is also a broad array of non-tourism specific platforms that offer short online learning options. Designed for individuals, these sites offer skill development across a broad spectrum of topics.

Figure 29 Typsy Crisis Mitigation Lesson



54 Think Impact (2021) Online Learning Market Size - https://www.thinkimpact.com/online-learning-market-size/#:~:text=It%20is%20predicted%20that%20by,valued%20at%20over%20%2420%20billion.
55 https://www.typsy.com/ - https://www.typsy.com/lessons/crisis-mitigation

Secondary opportunities

Secondary ICT opportunities exist in AR, productivity services, big data and drones.

Primary research indicated that whilst less familiar with these technologies, some MSMEs have capacity in the use of AR, productivity services, big data and drones. Once foundational skills and capacity has been developed with technology that the sector is comfortable with, operators may wish to engage in further prevention or preparedness through the integration of advanced technology.

Augmented reality and virtual reality

AR and VR can play a unique role in bringing disasters to life for prevention and preparedness. This enables learners to explore potential impacts, trial responses and build capacity prior to a disaster striking.

It is important to note that the primary research indicated respondents were more comfortable with the use of AR over VR, however both present significant opportunities in crafting simulations to support operator learning.

In disaster prevention, AR or VR technology can be used to identify hazards and conduct training scenarios within virtual environments (Figure 30). This enables staff and participants to develop a depth of understanding of how to respond to a disaster situation. The secondary research highlighted the use of VR in schools in Japan teaching children to respond to flooding scenarios. This in tourism and hospitality training schools, at workforce training sessions or within communities would enable a clear understanding of vulnerabilities and what action can be taken.

VR can also be utilized to test individual responses and mental stressors in relation to disaster events. When determining who is in a disaster response team within an organization, it is critical that the right people are selected for the right roles. Testing capacity, ability to keep calm under pressure and behavior will support human resource decisions that best deliver positive outcomes for the organization.

Figure 30 Augmented reality in disaster management


Search

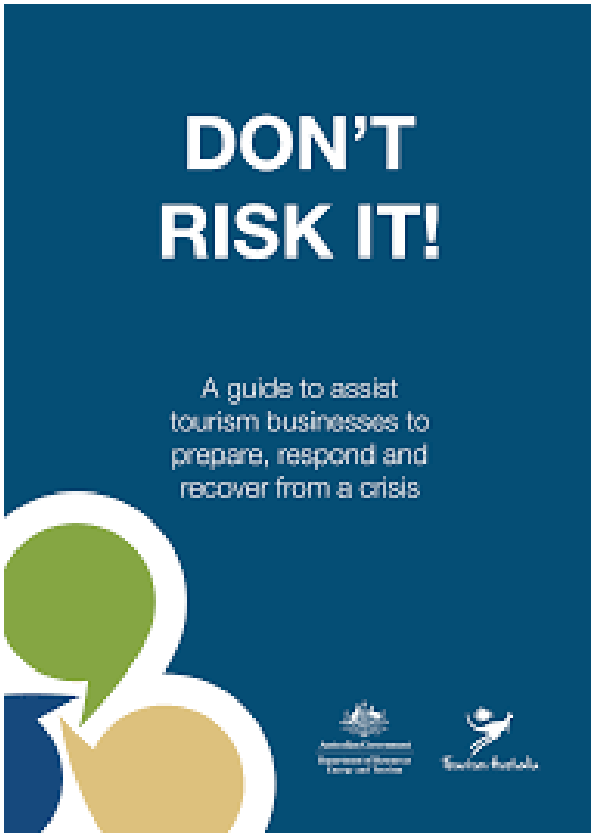
Productivity software

Interestingly the primary research analysis indicated a lack of comfort among respondent tourism operators with the use of productivity software. This may however be a lack of familiarity with the terminology.

Productivity software that may assist MSMEs in enhancing disaster management include:

- Microsoft 365 – Word, Excel and PowerPoint can all be utilized by tourism operators to develop continuity plans, to record information and data, develop risk assessments and to set systems and policies for disaster management. Existing toolkits, guides and workbooks can be used as a best practice baseline (Figure 31). Alternatively, MSMEs may wish to develop their own approach.
- Accounting software – can be used to support financial management and cash-flow forecasting is disaster situations.
- Planning – to-do-list or calendar software can set reminders to update critical information. This may be staff next of kin, review of risk assessments or to run test scenarios in staff training. Planning software can support MSMEs to engage regularly with disaster prevention and preparedness, shifting to a business-as-usual activity.
- Mind-mapping software – is useful to support medium sized enterprises in engaging staff in disaster management discussions, in risk mapping exercises and in scenario planning.
- Collaboration software – such as Asana can be utilized to build networks, share knowledge, create projects, and send requests to others within your network. Whether within medium sized enterprises or across destinations, collaboration software can create efficiencies, build networks of trust and build knowledge among engaged participants.
- Benchmarking tools – custom software can be used by tourism operators to measure and monitor their impact. By measuring their carbon footprint, tourism operators can identify key challenges and risks within their businesses. These in turn can be embedded into risk assessments with actions to reduce vulnerabilities, risks and the carbon footprint of the business creating sustainable and resilient businesses.

Figure 31 Templated support for tourism industry & sectors through productivity software



Advanced technology

Research from beyond the tourism sector indicates that significant work has been completed into the use of ICT and advanced technology in disaster management. Technology that perhaps MSMEs within the tourism industry are not aware of or are not yet confident in using. Such technologies and the application to disaster management are outlined below:

Big data

Big data presents opportunity to map where visitors are when disaster hits. With significant transient populations out of their normal place of home, often unsure of where to go and what to do, real time tracking can support effective visitor management in times of crisis (Figure 32).

Big data highlighted in the Phase One analysis also presents opportunity to identify safe evacuation routes based on historical disaster information. Mapped evacuation pathways can present MSMEs, visitors and communities with pathways to safety.

Whilst not accessible to all, with enhanced knowledge or through a centralized agency, big data can present MSMEs safer options during disaster situations. Primary research indicated that respondents had limited awareness of where to evacuate to in disaster situations. Effective dissemination of findings from big data mapping exercises would support MSMEs and communities to better prepare for the situations they face. Coordination and collaboration are critical to realize the benefits here.

Mobile applications

The wide-spread use of mobile phone applications presents opportunities to support disaster management through both online and offline capabilities. Existing applications have been used to guide MSMEs through disaster preparedness and response, taking the stress out of disaster management. Capabilities to build networks through connected communities within the application are also important to foster a collaborative approach to disaster management, to share learnings and to build capabilities across stakeholders.

Robotics

Robotics are typically seen within disaster response and recovery efforts (Figure 33). Whilst access and knowledge about this type of technology may be out of reach of many MSMEs, broader destination opportunities and tourism's positioning within disaster response networks may evolve into the future. With tourism operators understanding the local community and having an intimate knowledge of their surroundings, they play an essential role in support in a disaster event. Yet this capacity is not yet fulfilled, and tourism plays a limited role in disaster response. Further integration of the sector in the future may herald greater access to advanced technologies bringing broader benefits to MSMEs.

Figure 32 Big data mapping and flood projections for disaster preparedness

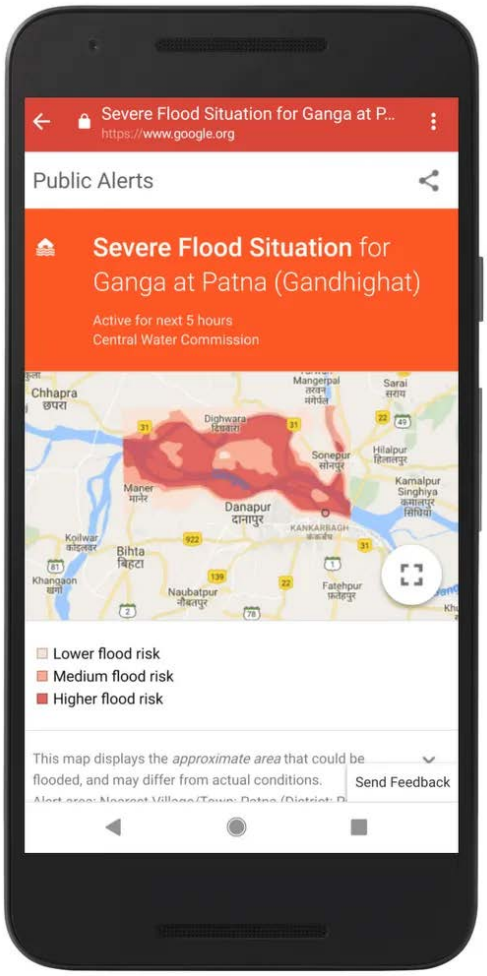


Figure 33 Robotics in disaster response

Recommendations

Based on the analysis of global best practice and primary research conducted with MSMEs in APEC economies, the following recommendations are put forward in relation to the pursuit of ICT to reduce vulnerabilities in the tourism industry:

1. **Simplicity** – Given the barriers (knowledge, time, and resources) identified to engagement with ICT and disaster management, simplicity is a must. Prioritization of technology that MSMEs are familiar with will support adoption in a timely and meaningful way.
2. **Prevention & preparedness** – simple tools that can be introduced to improve the preparedness of tourism MSMEs include websites, text messages and mobile applications.
    a. Whilst there is a plethora of information and materials available to MSMEs, knowing where to start is often a major barrier. DMOs or Government can support MSMEs more effectively by providing curated support materials to build knowledge and capacity.
    b. Text message systems can build disaster preparedness as a business-as-usual activity reminding MSMEs to complete actions such as reviewing their risks, conducting evacuation drills, or updating contact lists. Creating a culture where disaster management is business as usual builds capacity, reduces barriers and starts to engage networks.
    c. Mobile applications (such as CrisisReady – see case-studies in Phase One and What 3 Words) can be used to build knowledge, resources, and support for MSMEs. Maintaining the simple approach mobile applications can assist MSMEs to identify risks, support the development of a go pack, identify a management team, assign roles and responsibilities, and understand and rehearse response. Accessible online or offline, mobile applications put disaster management headquarters into MSMEs' pockets.
3. **Response –** maintaining a focus on simple tools, websites can be used to provide disaster management dashboards and up-to-date disaster impacts, road closures and evacuation protocols. Text messaging services can be used as warning systems to evacuate (and return) communities. Mobile applications can guide action and support decision making through disasters.
4. **Cross sector collaboration** – whilst tourism MSMEs note barriers to engagement with disaster preparedness and the use of some technology, there is already further advancement across other industries such as telcos and mining. Cross sector support and collaboration builds community capacity and reduces vulnerabilities. Engaging with broader disaster management networks may

support both the tourism industry and bring additional resources to response and recovery efforts. Disaster management and the reduction of vulnerability is not an independent action. Collaboration is key. The first step in achieving this is in tourism's participation in localized disaster management groups. Understanding that the sector can contribute significant resources, the DMO or Government are best placed to integrate the sector through advocacy and engagement.

5. **Training and support** – MSMEs are unlikely to engage with disaster management principles without imperative action put in place. Whether having experienced an event or through incentivization, there needs to be a strong motivation to take time from daily operations. Understanding that knowledge acts as a core barrier to further prevention and preparedness, implementing effective training guides and materials is critical. Time is also recognized as a barrier to engagement, therefore drawing on flexible learning options creates on-demand options for MSMEs to engage in a time and way that suits them. Whether recognized micro-credentials or short pre-recorded videos, short online options to build capacity led by authorities on disaster resilience can reduced barriers and strengthen communities.
6. **Policy –** the policy environment needs to support digital and disaster preparedness uptake. This can be achieved through both "carrot and stick" measures. Grant and recognition frameworks should include disaster resilience (risk management) principles as a core component. Tourism strategy development should also factor in risk, resilience, and sustainability, identifying actions for destination resilience and operator engagement with sustainable and resilient futures.
    a. Tourism policy focusing on growth and competitiveness includes promotion, balance of trade, visa policies, business development and investment. Integration of disaster management to build capacity will strengthen overarching destination competitiveness creating long-term benefits to the destination. To achieve this, rather than specific programs or policies, future programs and policies should embed disaster resilience. Education, training, promotion and investment all have aspects that relate.

Next Steps

Socio-political contexts across different economies will require different approaches to be taken to foster disaster resilience, reduce vulnerabilities and further engage MSMEs with the use of ICT. However, no matter which economy, tourism is a vulnerable sector that requires adaptation and action, yet policies do not deliver the outcomes required to support a sustainable and resilient future. The following next steps need to be considered to deliver outcomes that support the reduction of vulnerability, strengthening of capacity and positive uptake of ICT and digital technologies:

1. **Support MSMEs in reducing barriers and engaging in disaster management.** To achieve any real outcome in the reduction of vulnerability, capacity is the foundation. On-going support programs that build awareness of the real risks that will impact MSMEs across the sector, that increase capacity in preparing for disaster events and that deliver insight into adaption are required for MSMEs. Without such, there will continue to be a lack of preparedness and engagement with disaster management processes – including proper insurance coverage.
2. **Encourage uptake and investment in ICT and digital technologies by MSMEs across the tourism industry**. Digital technology can support MSMEs in driving efficiencies and productivity not only in disaster management, but also in human resource management, resource use efficacy (sustainability), marketing and experience development to highlight a few. Creating a policy environment that facilitate and supports digital transformation across the tourism industry will build capacity, reduce vulnerability, and drive innovation. A friendly policy framework creates accessibility, reduces barriers, and presents solutions to the challenges MSMEs are facing.
3. **Recognize tourism's role in disaster management.** Tourism plays an important role in communities and in disaster response and recovery. For economies that rely heavily on the tourism sector, it is important that it has an official role to play in the disaster management framework, elevating the significance and creating a reason to engage MSMEs in stronger prevention and preparedness. Through the resources that the tourism has to offer (accommodation, generators, food, and beverage) and the connection with people (community and visitors) there is a role in preparedness and response. Ensuring adequate representation of the sector in decision making forums will strengthen a coordinated approach that leverages the benefits of the resources the sector has.
4. Supporting a narrative where **disaster management is a business-as-usual** activity will start to drive change. This is not an activity that should occur once a year but is an always on technique to reduce business vulnerability.

APPENDICES

Appendix I – Survey instrument: phase 2

Asia – Pacific Economic Cooperation

APEC - Tourism Crisis Preparedness and the use of ICT

Preparación para crisis turísticas y uso de las TIC

Introduction
Introducción
Tourism is vulnerable to risk as it is a complex network that is interconnected to other sectors of the economy. Despite this, with proper management, the tourism sector can act as a catalyst to achieve economic and social development of economies in their recovery efforts.

El turismo es vulnerable al riesgo, ya que es una red compleja que está interconectada con otros sectores de la economía. A pesar de esto, con una gestión adecuada, el sector turístico puede actuar como catalizador para lograr el desarrollo económico y social de las economías en sus esfuerzos de recuperación.

Now is the time to consider the vulnerability of tourism on a global scale and rethink the systems and structures that support this critical industry. This research is designed to examine business risk management of micro, small and medium enterprises (MSMEs) in the tourism industry to build resilience and to strengthen the visitor economy for a sustainable future.

Ahora es el momento de considerar la vulnerabilidad del turismo a escala global y repensar los sistemas y estructuras que sustentan a esta industria crítica. Esta investigación está diseñada para examinar la gestión de riesgos comerciales de las micro, pequeñas y medianas empresas (MiPyMEs) en la industria del turismo para generar resiliencia y fortalecer la economía de visitantes para un futuro sostenible.

The research is being led by APEC with the support of EarthCheck. All responses will be kept anonymous and there will be no identifying details published. Any data collected will only be accessible to members of the research team for the duration of the project. No identifiable data will be included in subsequent reports or publications.

La investigación está siendo dirigida por APEC con el apoyo de EarthCheck. Todas las respuestas se mantendrán en el anonimato y no se publicarán datos identificativos. Los datos recopilados solo serán accesibles para los miembros del equipo de investigación durante la duración del proyecto. No se incluirán datos identificables en informes o publicaciones posteriores.

Your participation in this survey is purely voluntary. If you choose to complete the survey, you are not obliged to answer every question unless you wish to do so. Where asked, you are not obliged to give specific examples unless you wish to do so. If you choose to not complete the questionnaire, your decision will in no way impact on any relationship you currently have. Data will be handled in accordance with EarthCheck's privacy policy.

Su participación en esta encuesta es puramente voluntaria. Si elige completar la encuesta, no está obligado a responder todas las preguntas a menos que desee hacerlo. Cuando se le solicite, no está obligado a dar ejemplos específicos a menos que desee hacerlo. Si elige no completar el cuestionario, su decisión no afectará de ninguna manera cualquier relación que tenga actualmente. Los datos se manejarán de acuerdo con la política de privacidad de EarthCheck.

For more information about this project please contact Dr Natasha Montesalvo at Natasha.montesalvo@earthcheck.org or call +61 7 3924 4200.

Para obtener más información sobre este proyecto, comuníquese con la Dra. Natasha Montesalvo al correo electrónico Natasha.montesalvo@earthcheck.org o llame al +61 7 3924 4200.

Tell us about your business Cuéntenos sobre su negocio

1. Business ownership structure • **Sole trader** • **Partnership** • **Limited liability company** • **Branch of company incorporated overseas** • **Co-operative company** • **Other (please specify)**	1. Estructura de propiedad empresarial • **Trabajador por cuenta propia** • **Sociedad** • **Empresa de responsabilidad limitada** • **Sucursal de empresa constituida en el extranjero** • **Empresa Cooperativa** • **Otra (por favor especifique)**
2. Location of operation • Australia • Brunei Darussalam • Canada • Chile • People's Republic of China • Hong Kong, China • Indonesia • Japan • Republic of Korea • Malaysia • Mexico • New Zealand • Papua New Guinea • Peru • The Philippines • The Russian Federation • Singapore • Chinese Taipei • Thailand • United States of America • Vietnam • Other (please specify)	**2. Lugar de operación** • Australia • Brunei Darussalam • Canadá • Chile • República Popular de China • Hong Kong, China • Indonesia • Japón • República de Corea • Malasia • México • Nueva Zelanda • Papúa Nueva Guinea • Perú • Las Filipinas • La Federación Rusa • Singapur • Taipei Chino • Tailandia • Estados Unidos de América • Vietnam • Otros (por favor especifique)
3. Company History in region of headquarters • Less than 1 year • 1-4 years • 5-9 years • 10-14 years • >15 years	**3. Historia de la empresa en la región de la sede central** • Menos de 1 año • 1-4 años • 5-9 años • 10-14 años •> 15 años

4. Number of full time equivalent employees (those equating to 8 hour work days)	**4. Número de empleados equivalentes a tiempo completo (los que equivalen a jornadas laborales de 8 horas)**
5. Staff turnover rate % (proportion of your staff who left during the last year).	**5. Tasa de rotación de personal % (proporción de su personal que se fue durante el último año).**
6. Trading Status of your business • Operates all year round • Seasonal • Depends on economic cycle • Significantly impacted by COVID-19	**6. Estado comercial de su empresa** • Opera todo el año • Estacional • Depende del ciclo económico • Impactado significativamente por el COVID-19
7. My business currently uses the following forms of ICT in general operations (select all that apply) • Computer reservations systems • Social media • Ticketing • Accounting software • Augmented reality • Virtual reality • Online training programs for staff • Robotics • Drones • Big data • Key-less locks • Productivity software (e.g. word processing) • Websites and other digital marketing media • Other 3rd party distribution and booking sites • Other (please specify)	**7. En la actualidad, mi empresa utiliza las siguientes formas de TIC en operaciones generales (seleccione todas las que correspondan)** Sistemas informáticos de reservas Redes sociales Venta de entradas Programa de contabilidad Realidad aumentada Realidad virtual Programas de formación en línea para el personal Robótica Drones Big data Entrada sin llaves Software de productividad (por ejemplo, procesamiento de textos) Sitios web y otros medios de marketing digital Otros sitios de distribución y de reservas de terceras partes Otros (por favor especifique)

These questions explore how prepared your business is to respond to a crisis situation

Estas preguntas exploran qué tan preparada está su empresa para responder a una situación de crisis.

Please select the most appropriate response for the following statements

Por favor seleccione la respuesta más adecuada para las siguientes afirmaciones

8. I am mindful of how a • Natural disaster will impact my business • Health related disaster will impact my business • Cybercrime will impact my business • Financial disaster will impact my business • Political crisis will impact my business • Other minor crisis (e.g. a localized power outage in your business or flooding of the laundry facilities) may impact my business *Respondents select one answer from below for each statement.* • Strongly agree • Agree • Neither agree or disagree • Disagree • Strongly disagree	8. Soy consciente de cómo • Los desastres naturales afectarán mi negocio • Los desastres relacionados con la salud afectarán mi negocio • Los delitos cibernéticos afectarán mi negocio • Los desastres financieros afectarán mi negocio • Las crisis políticas afectarán mi negocio • Otras crisis menores (por ejemplo, un corte de energía localizado en su negocio o una inundación de las instalaciones de lavandería) pueden afectar mi negocio. *Respondents select one answer from below for each statement* • Totalmente de acuerdo • De acuerdo • Ni de acuerdo ni desacuerdo • En desacuerdo • Muy en desacuerdo
9. My business has • Crisis management plan (a plan for actions to take before, during and after a crisis is in place) • An emergency evacuation plan in place (a plan for action during crisis) • A continuity plan (a plan for actions to take after a crisis) in pace	**9. Mi negocio tiene** • Plan de gestión de crisis (un plan de acciones a tomar antes, durante y después de una crisis) • Existe un plan de evacuación de emergencia (un plan de acción durante una crisis) • Existe un plan de continuidad (un plan de acciones a tomar después de una crisis)

• Online management systems to support crisis response *Respondents select one answer from below for each statement* • Yes • No • Unsure	• Sistemas de gestión en línea para apoyar la respuesta a crisis *Respondents select one answer from below for each statement* • Sí • No • No estoy seguro
10. I believe crisis management plans must be • practiced to be effective • tested to be effective • regularly updated to be effective *Respondents select one answer from below for each statement.* • Strongly agree • Agree • Neither agree or disagree • Disagree • Strongly disagree	**10. Creo que los planes de gestión de crisis deben ser** • practicados para ser efectivos • probados para ser efectivos • actualizados periódicamente para ser efectivos *Respondents select one answer from below for each statement* • Totalmente de acuerdo • De acuerdo • Ni de acuerdo ni desacuerdo • En desacuerdo • Muy en desacuerdo
11. I test my crisis management plans • Bi – annually (twice a year) • Annually • Biennially (every two years) • Every 5 years • Never • Other (please specify)	**11. Pongo a prueba mis planes de gestión de crisis** • Semestralmente (dos veces al año) • Anualmente • Bienalmente (cada dos años) • Cada 5 años • Nunca • Otros (por favor especifique)
12. I update my risk assessment (identification of risk, likelihood and impact of risk and mitigation actions) • Do not have a risk assessment • Bi-Annually (twice a year) • Annually • Biennially (every 2 years) • Every 5 years • Never	**12. Actualizo mi evaluación de riesgos (identificación de riesgo, probabilidad e impacto del riesgo y acciones de mitigación)** • No tiene una evaluación de riesgos • Semestralmente (dos veces al año) • Anualmente • Bienalmente (cada 2 años) • Cada 5 años

• Other (please specify)	• Nunca • Otros (por favor especifique)
13. Please select the top three threats to your business (pick three only): • Flood • Fire • Cyclone • Landslip • Extreme heat • Earthquake • Dam failure • Biosecurity (emergency animal/ plant disease) • Cyberbreach • Epidemic/ pandemic • Power outage • Bad debt • Brand fatigue • Poor business strategy • Cash-flow • Increased competition • Compliance with regulation • Copyright theft • Customer satisfaction • Commercial espionage • Exchange rates • Failure of utilities • Water shortages • Health and safety • Loss of key staff • Political instability • Terrorism • Recession • Reputation • Seasonality • Under-resourcing • Incidents with tourists (injury/ death) • Other (please specific)	**13. Seleccione las tres principales amenazas para su empresa (elija solo tres):** Inundación Fuego Ciclón Derrumbe Calor extremo Terremoto Fallo de presa Bioseguridad (enfermedad animal / vegetal de emergencia) Violación cibernética Epidémia / pandemia Corte de energía Deudas incobrables Fatiga de la marca Mala estrategia comercial Flujo de efectivo Aumento de la competencia Cumplimiento de la normativa Robo de derechos de autor Satisfacción del cliente Espionaje comercial Tipos de cambio Falla de servicios públicos Escasez de agua Salud y seguridad Pérdida de personal clave • Inestabilidad política • Terrorismo • Recesión • Reputación • Estacionalidad • Falta de recursos • Incidentes con turistas (lesiones / muerte) • Otro (por favor especifique)
14. Please select the response that reflects your business the best:	**14. Seleccione la respuesta que mejor refleje su negocio:**

I have the following strategies in place to minimise the impact associated with potential risks. • HR strategy • Cash Flow Strategy • Communication Strategy • Marketing Strategy • ICT strategy *Respondents select one answer from below for each statement* • Yes • No • Unsure	**Cuento con las siguientes estrategias para minimizar el impacto asociado con los riesgos potenciales.** • Estrategia de recursos humanos • Estrategia de flujo de caja • Estrategia de comunicación • Estrategia de marketing • Estrategia de TIC *Respondents select one answer from below for each statement* • Sí • No • No estoy seguro
15. Please select all the technology that you are currently using to support your crisis preparedness, response and recovery • Social media • Cloud based computer systems for record holding • Drones • Big data • Virtual reality • Augmented reality • Online training platforms (e.g. mico-credential or MOOCs) • Mobile Apps • Other (please specify)	**15. Seleccione toda la tecnología que está utilizando actualmente para respaldar su preparación, respuesta y recuperación ante crisis.** • Redes sociales • Sistemas informáticos basados en la nube para mantener registros • Drones • Big data • Realidad virtual • Realidad aumentada • Plataformas de formación en línea (Ej., Mico-credenciales o MOOCs) • Aplicaciones móviles • Otros (por favor especifique)
16. **Please rank the following types of technology from most useful to least useful. (one being the least useful and 8 being the most useful)** • Social media • Cloud based computer systems for record holding • Drones • Big data • Virtual reality • Augmented reality • Online training platforms (e.g. mico-credential or MOOCs)	**16. Por favor proporcione un ejemplo del uso más útil de la tecnología en sus esfuerzos de preparación, respuesta y/o recuperación antes crisis.** **Clasifique los siguientes tipos de tecnología de la más útil a la menos útil. (siendo 1 el menos útil y el 8 el más útil)** • Redes sociales • Sistemas informáticos basados en la nube para mantener registros • Drones • Big data

• Mobile Apps	• Realidad virtual • Realidad aumentada • Plataformas de formación en línea (Ej., Mico-credenciales o MOOCs) • Aplicaciones móviles
17. What are the biggest barriers to you using ICT in your crisis preparedness, responses and/or recovery? Select all that apply • Lack of access to technology • Lack of awareness as to what technology is available • Lack of awareness of how technology is available • Lack of awareness of how technology can support crisis management • Cost • Lack of skills among staff to implement • Other (please specify)	**17. ¿Cuáles son las mayores barreras para el uso de las TIC en su preparación, respuesta y/o recuperación ante crisis? Seleccione todas las que correspondan** • Falta de acceso a la tecnología • Falta de conocimiento sobre la tecnología disponible. • Falta de conocimiento de cómo está disponible la tecnología. • Falta de conocimiento de cómo la tecnología puede apoyar la gestión de crisis. • Coste • Falta de habilidades entre el personal para implementar • Otros (por favor especifique)

The following questions explore your business and staff adaptability to crisis situations

Las siguientes preguntas exploran la adaptabilidad de su empresa y su personal a situaciones de crisis.

Please select the most appropriate response for the following set of statements:

Seleccione la respuesta más adecuada para el siguiente conjunto de afirmaciones:

18. I am able to shift rapidly from business – as -usual to respond to a crisis • Very confident • Confident • Not very confident • I have not thought about this before • Not confident at all	**18. Puedo pasar rápidamente de una situación normal a responder a una crisis.** • Muy seguro • Seguro • No muy seguro • No he pensado en esto antes • No tengo ninguna confianza
19. The biggest barriers to my crisis preparedness are (select all that apply) • Time • Knowledge • Finances • Network • Don't see a need to • Lack of key contacts • Not in an area that is impacted by crisis • Other (please specifiy)	**19. Las mayores barreras para mi preparación ante una crisis son (seleccione todas las opciones que correspondan)** • Tiempo • Conocimiento • Finanzas • Red • No veo la necesidad • Falta de contactos clave • No en un área afectada por una crisis • Otro (por favor especifique)
20. I have used online systems to keep my business running when a crisis has occurred? Yes No	**20. ¿He utilizado sistemas en línea para mantener mi negocio en funcionamiento cuando ha ocurrido una crisis?** Sí No
21. Please select the level of confidence that best reflects your business situation: **I have a business continuity strategy for** • Staff • Premises • Technology and ICT • Knowledge management • Suppliers • Other stakeholders	**21. Seleccione el nivel de confianza que mejor refleje la situación de su empresa:** **Tengo una estrategia de continuidad empresarial para** • Personal • Locales • Tecnología y TIC • Gestión del conocimiento • Proveedores • Otras partes interesadas

Respondents select one answer from below for each statement. • Very confident • confident • I have not thought about this before • Not very confident • Not confident at all	*Respondents select one answer from below for each statement.* • Muy seguro • Seguro • No he pensado en esto antes • No muy seguro • No tengo ninguna confianza
22. Please select the response that best reflects your business situation: **I am able to build relationships with the following organisation I might have to work with in a crisis.** • Destination management organisation (DMO) • Local or state government • Government • Other tourism operators • Other suppliers *Respondents select one answer from below for each statement.* • I already have a strong relationship • Yes • No • Unsure	**22. Seleccione la respuesta que mejor refleje la situación de su empresa:** **Puedo establecer relaciones con la siguiente organización con la que podría tener que trabajar en una crisis.** • Organización de gestión de destinos (DMO) • Gobierno local o estatal • Gobierno nacional • Otros operadores turísticos • Otros proveedores *Respondents select one answer from below for each statement.* • Ya tengo una relación sólida • Sí • No • No estoy seguro
23. Please select the most appropriate response for the following statement: **My senior management & operational management teams are trained in business continuity and managing incidents.** • Very confident	**23. Seleccione la respuesta más apropiada para la siguiente afirmación:** **Mis equipos de dirección y de gestión operativa están capacitados en continuidad empresarial y gestión de incidentes.** • Muy seguro • Seguro • No muy seguro • No tengo ninguna confianza

• Confident • Not very confident • Not confident at all • I have not thought about this before	• No he pensado en esto antes
24. My organisation has a strong culture that provides direction for staff in a crisis • Very confident • Confident • Not very confident • Not confident at all • I have not thought about this before	**24. Mi organización tiene una cultura sólida que proporciona orientación al personal en situaciones de crisis.** • Muy seguro • Seguro • No muy seguro • No tengo ninguna confianza • No he pensado en esto antes
25. My staff have the information and knowledge they need to respond to unexpected problems • Very confident • Confident • Not very confident • Not confident at all • I have not thought about this before	**25. Mi personal tiene la información y el conocimiento que necesitan para responder a problemas inesperados.** • Muy seguro • Seguro • No muy seguro • No tengo ninguna confianza • No he pensado en esto antes
26. Please select the response that best reflects your business situation: **My business has enough of the following resources to continue operating when normal business Is disrupted:** • Human resources • Financial resources • Technological resources • Other physical resources *Respondents select one answer from below for each statement.* • Yes • No • Unsure	**26. Seleccione la respuesta que mejor refleje la situación de su empresa:** **Mi negocio tiene suficientes de los siguientes recursos para seguir funcionando cuando se interrumpe la actividad normal:** • Recursos humanos • Recursos financieros • Recursos tecnológicos • Otros recursos físicos *Respondents select one answer from below for each statement.* • Sí • No • No estoy seguro

The following questions explore the practical steps you have in place to respond to a crisis

Las siguientes preguntas exploran los pasos prácticos que tiene implementados para responder a una crisis.

27. We have the procedure in place to ensure critical data is backed up regulatory and is readily available offsite • Yes • No • Unsure	**27. Contamos con el procedimiento para garantizar que los datos críticos tengan una copia de seguridad reglamentaria y estén fácilmente disponibles fuera del sitio.** • Sí • No • No estoy seguro
28. A go-kit (a set of resources that are easily accessible in a crisis) has bene set up and is accessible • Yes • No • Unsure	**28. Un go-kit (un conjunto de recursos a los que se puede acceder fácilmente en una crisis) se ha configurado y es accessible** • Sí • No • No estoy seguro
29. Staff contact lists are up-to-date lists and includes next of kin, that can be accessed offsite? • Yes • No • Unsure	**29. Las listas de contactos del personal son listas actualizadas e incluyen a los familiares más cercanos a los que se puede acceder fuera del sitio.** • Sí • No • No estoy seguro
30. Staff are aware of how they will be communicated with during a service disruption, during any given period? • Yes • No • Unsure	**30. El personal sabe cómo se comunicará con ellos durante una interrupción del servicio, durante un período determinado.** • Sí • No • No estoy seguro
31. Staff with communicate with guests during a service disruption through the following channels (tick all that apply) • Verbally • Brochures	**31. El personal se comunica con los huéspedes durante una interrupción del servicio a través de los siguientes canales (marque todos los que correspondan)** • Verbalmente • Folletos

• Social media • Website • Through 3rd parties (e.g. distributors) • Mobile phone (text message) • Telephone calls • Other (please specify)	• Redes sociales • Sitio web • A través de terceros (por ejemplo, distribuidores) • Teléfono móvil (mensaje de texto) • Llamadas telefónicas • Otros (por favor especifique)
32. My business has a dedicated media spokes-person to manage a PR situation affecting reputation and ability to operate. • Yes • No • Unsure	**32. Mi empresa cuenta con un portavoz de medios dedicado a gestionar una situación de relaciones públicas que afecte la reputación y la capacidad para operar.** • Sí • No • No estoy seguro
33. I am fully aware of the following essential services within my business area • Emergency services (i.e. police service, ambulance service, fire station, state emergency service) • Medical facilities (i.e. hospital/ health services) • Federal government operations (i.e. the defence force) • Neighbourhood safer places (a local open space or building where people may gather as a last resort to seek shelter from a bush fire) • Big data mapping of high risk areas • Drone operators for crisis recovery efforts *Respondents select one answer from below for each statement.* • Very confident • confident • I have not thought about this before • Not very confident • Not confident at all	**33. Soy plenamente consciente de los siguientes servicios esenciales dentro de mi área de negocio** • Servicios de emergencia (es decir, servicio de policía, servicio de ambulancia, estación de bomberos, servicio de emergencia estatal) • Instalaciones médicas (es decir, hospitales / servicios de salud) • Operaciones del gobierno federal (es decir, la fuerza de defensa) • Lugares más seguros del vecindario (un espacio abierto local o un edificio donde las personas pueden reunirse como último recurso para buscar refugio de un incendio forestal) • Mapeo de big data de áreas de alto riesgo • Operadores de drones para esfuerzos de recuperación de crisis *Respondents select one answer from below for each statement.* • Muy seguro • Seguro • No he pensado en esto antes • No muy seguro

	• No tengo ninguna confianza

These questions explore your confidence in building a culture of crisis readiness
Estas preguntas exploran su confianza en la construcción de una cultura de preparación ante crisis.

34. Please select the response that best reflects your business: **I am confident that my business has been actively involved in the following activities** • Building a culture of prevention and preparedness • Integrating resilience into disaster plans • Having pre-disaster trainings and/or simulations • Having sufficient knowledge on hazard management • Establishing clear lines of responsibility • Having early warning systems in place • Using ICT in our crisis response • Offering regular staff training in crisis responses • Conducting regular evacuation drills with staff *Respondents select one answer from below for each statement.* • Very confident • confident • I have not thought about this before • Not very confident • Not confident at all	**34. Seleccione la respuesta que mejor refleje su empresa:** **Estoy seguro de que mi empresa ha participado activamente en las siguientes actividades** • Construir una cultura de prevención y preparación • Integrar la resiliencia en los planes para casos de desastre • Tener capacitaciones y/o simulaciones previas al desastre • Tener suficiente conocimiento sobre la gestión de peligros. • Establecer líneas claras de responsabilidad • Disponer de sistemas de ingresos anticipados • Uso de las TIC en nuestra respuesta a la crisis • Ofrecer formación periódica al personal en respuesta a crisis. • Realización de simulacros de evacuación regulares con el personal *Respondents select one answer from below for each statement.* • Muy seguro • Seguro • No he pensado en esto antes • No muy seguro • No tengo ninguna confianza
35. To improve my capability to use ICT to prepare, respond and recover from a crisis I require support from:	**35. Para mejorar mi capacidad de utilizar las TIC para prepararme,**

• Destination management organisation (DMO) • Local or state government • Government • Other tourism operators • Other suppliers	**responder y recuperarme de una crisis, necesito el apoyo de:** • Organización de gestión de destinos (DMO) • Gobierno local o estatal • Gobierno nacional • Otros operadores turísticos • Otros proveedores

Appendix II – ANOVA analysis

The following analysis tests for significant differences across the business ownership:

i. Partnership

ii. Limited liability company

iii. Other

			Sum of Squares	df	Mean Square	F	Sig.
Question 8 I am mindful of how a	Natural disaster will impact my business	Between Groups	.227	2	.114	.323	.724
		Within Groups	77.995	222	.351		
		Total	78.222	224			
	Health related disaster will impact my business	Between Groups	.495	2	.247	.817	.443
		Within Groups	67.822	224	.303		
		Total	68.317	226			
	Cybercrime will impact my business	Between Groups	.044	2	.022	.050	.951
		Within Groups	98.476	224	.440		
		Total	98.520	226			
	Financial disaster will impact my business	Between Groups	1.323	2	.661	2.527	.082
		Within Groups	58.359	223	.262		
		Total	59.681	225			
	Political crisis will impact my business	Between Groups	.164	2	.082	.173	.841
		Within Groups	105.787	223	.474		
		Total	105.951	225			
	Other minor crisis (e.g. a localized power outage in your business or the flooding of the laundry facilities) may impact my business	Between Groups	1.260	2	.630	.923	.399
		Within Groups	152.143	223	.682		
		Total	153.403	225			
Question 10 I believe crisis management plans must be	practiced to be effective	Between Groups	.185	2	.092	.335	.715
		Within Groups	61.430	223	.275		
		Total	61.615	225			

			Sum of Squares	df	Mean Square	F	Sig.
	tested to be effective	Between Groups	.616	2	.308	1.084	.340
		Within Groups	62.813	221	.284		
		Total	63.429	223			
	regularly updated to be effective	Between Groups	.175	2	.087	.376	.687
		Within Groups	51.896	223	.233		
		Total	52.071	225			
Question 16 Please give an example of the most useful example of using technology in your crisis preparedness, response and/or recovery efforts (one being the least useful and 8 being the most useful)	Social media	Between Groups	29.090	2	14.545	5.436	.005
		Within Groups	577.924	216	2.676		
		Total	607.014	218			
	Cloud based computer systems for record holding	Between Groups	2.364	2	1.182	.520	.595
		Within Groups	479.267	211	2.271		
		Total	481.631	213			
	Drones	Between Groups	25.679	2	12.840	4.540	.012
		Within Groups	602.427	213	2.828		
		Total	628.106	215			
	Big data	Between Groups	38.740	2	19.370	6.789	.001
		Within Groups	607.700	213	2.853		
		Total	646.440	215			
	Virtual reality	Between Groups	16.737	2	8.368	8.016	<.001
		Within Groups	220.273	211	1.044		
		Total	237.009	213			
	Augmented reality	Between Groups	24.893	2	12.446	4.229	.016
		Within Groups	635.746	216	2.943		
		Total	660.639	218			
	Online training platforms (e.g. mico-credential or MOOCs)	Between Groups	5.389	2	2.694	.962	.384
		Within Groups	599.238	214	2.800		
		Total	604.627	216			
	Mobile Apps	Between Groups	93.808	2	46.904	8.714	<.001
		Within Groups	1173.351	218	5.382		
		Total	1267.158	220			

			Sum of Squares	df	Mean Square	F	Sig.
Question 18 Please give an example of the most useful example of using technology in your crisis preparedness, response and/or recovery efforts (one being the least useful and 8 being the most useful)I am able to shift rapidly from business-as-usual to respond to a crisis		Between Groups	7.016	2	3.508	5.318	.006
		Within Groups	143.143	217	.660		
		Total	150.159	219			
Question 21 Please select the level of confidence that best reflects your business situation: I have a business continuity strategy for	Staff	Between Groups	2.393	2	1.196	2.333	.099
		Within Groups	110.236	215	.513		
		Total	112.628	217			
	Premises	Between Groups	20.448	2	10.224	6.818	.001
		Within Groups	317.906	212	1.500		
		Total	338.353	214			
	Technology & ICT	Between Groups	18.498	2	9.249	6.774	.001
		Within Groups	293.557	215	1.365		
		Total	312.055	217			
	Knowledge Management	Between Groups	18.376	2	9.188	6.140	.003
		Within Groups	321.738	215	1.496		
		Total	340.115	217			
	Suppliers	Between Groups	30.959	2	15.479	10.269	<.001
		Within Groups	322.590	214	1.507		
		Total	353.548	216			
	Other Stakeholders	Between Groups	16.283	2	8.141	6.535	.002
		Within Groups	262.862	211	1.246		
		Total	279.145	213			
Q23 Please select the most appropriate response for the following statements: My senior management & operational management teams are trained in business continuity and managing incidents		Between Groups	4.186	2	2.093	1.344	.263
		Within Groups	337.973	217	1.557		
		Total	342.159	219			
Q24 My organisation has a strong culture that provides direction for staff in a crisis		Between Groups	1.037	2	.518	.552	.577
		Within Groups	203.922	217	.940		
		Total	204.959	219			
		Between Groups	1.285	2	.643	1.061	.348

			Sum of Squares	df	Mean Square	F	Sig.
Q25 My staff have the information and knowledge they need to respond to unexpected problems		Within Groups	130.751	216	.605		
		Total	132.037	218			
Q33 I am fully aware of the following essential services within my business area	Emergency services (i.e. police service, ambulance service, fire station, state emergency service)	Between Groups	31.500	2	15.750	10.233	<.001
		Within Groups	329.385	214	1.539		
		Total	360.885	216			
	Medical facilities (i.e. hospital/health services)	Between Groups	40.287	2	20.144	13.061	<.001
		Within Groups	326.950	212	1.542		
		Total	367.237	214			
	Federal government operations (i.e. the Defence Force)	Between Groups	23.721	2	11.861	10.272	<.001
		Within Groups	245.941	213	1.155		
		Total	269.662	215			
	Neighbourhood safer places (a local open space or building where people may gather as a last resort to seek shelter from a bushfire)	Between Groups	25.134	2	12.567	7.506	<.001
		Within Groups	356.639	213	1.674		
		Total	381.773	215			
	Big data mapping of high risk areas	Between Groups	13.274	2	6.637	5.112	.007
		Within Groups	273.959	211	1.298		
		Total	287.234	213			
	Drone operators for crisis recovery efforts	Between Groups	8.069	2	4.035	4.886	.008
		Within Groups	175.889	213	.826		
		Total	183.958	215			
Q34 Please select the response that best reflects your business: I am confident that my business has been actively involved in the following activities	Building a culture of prevention and preparedness	Between Groups	28.443	2	14.221	12.444	<.001
		Within Groups	242.283	212	1.143		
		Total	270.726	214			
	Integrating resilience into disaster plans	Between Groups	15.755	2	7.878	6.132	.003
		Within Groups	271.072	211	1.285		
		Total	286.827	213			
	Having pre-disaster trainings and/or simulations	Between Groups	20.393	2	10.197	7.013	.001
		Within Groups	308.230	212	1.454		

			Sum of Squares	df	Mean Square	F	Sig.
		Total	328.623	214			
	Having sufficient knowledge on hazard management	Between Groups	34.413	2	17.206	11.940	<.001
		Within Groups	305.513	212	1.441		
		Total	339.926	214			
	Establishing clear lines of responsibility	Between Groups	23.777	2	11.889	8.471	<.001
		Within Groups	297.543	212	1.404		
		Total	321.321	214			
	Having early warning systems in place	Between Groups	27.465	2	13.732	8.933	<.001
		Within Groups	325.884	212	1.537		
		Total	353.349	214			
	Using ICT in our crisis response	Between Groups	28.071	2	14.035	8.248	<.001
		Within Groups	360.766	212	1.702		
		Total	388.837	214			
	Offering regular staff training in crisis responses	Between Groups	30.604	2	15.302	9.658	<.001
		Within Groups	335.889	212	1.584		
		Total	366.493	214			
	Conducting regular evacuation drills with staff	Between Groups	14.328	2	7.164	4.874	.009
		Within Groups	311.607	212	1.470		
		Total	325.935	214			

The table below is the ANOVA analysis testing for significant differences among MSMEs, results highlighted in red indicate a significant difference.

iv. Micro businesses （1-5）

v. Small businesses （6-19）

vi. Medium businesses （20-199）

vii. Large businesses （>=200）.

			Sum of Squares	df	Mean Square	F	Sig.
Question 8 I am mindful of how a	Natural disaster will impact my business	Between Groups	.961	3	.320	.851	.467
		Within Groups	83.535	222	.376		
		Total	84.496	225			
	Health related disaster will impact my business	Between Groups	1.524	3	.508	1.695	.169
		Within Groups	67.155	224	.300		
		Total	68.680	227			
	Cyber-crime will impact my business	Between Groups	4.054	3	1.351	3.139	.026
		Within Groups	96.420	224	.430		
		Total	100.474	227			
	Financial disaster will impact my business	Between Groups	.157	2	.079	.297	.743
		Within Groups	59.349	224	.265		
		Total	59.507	226			
	Political crisis will impact my business	Between Groups	4.373	2	2.187	4.901	.008
		Within Groups	99.944	224	.446		
		Total	104.317	226			
	Other minor crisis (e.g. a localized power outage in your business or the flooding of the laundry facilities) may impact my business	Between Groups	1.259	2	.629	.905	.406
		Within Groups	155.799	224	.696		
		Total	157.057	226			
Question 10 I believe crisis management plans must be	practiced to be effective	Between Groups	.539	2	.270	.972	.380
		Within Groups	62.148	224	.277		
		Total	62.687	226			
	tested to be effective	Between Groups	.424	2	.212	.740	.478
		Within Groups	63.576	222	.286		
		Total	64.000	224			
	regularly updated to be effective	Between Groups	.790	2	.395	1.708	.184
		Within Groups	51.818	224	.231		
		Total	52.608	226			
Question 16 Please give an example of	Social media	Between Groups	116.757	3	38.919	17.345	<.001
		Within Groups	482.430	215	2.244		
		Total	599.187	218			

			Sum of Squares	df	Mean Square	F	Sig.
the most useful example of using technology in your crisis preparedness, response and/or recovery efforts (one being the least useful and 8 being the most useful)	Cloud based computer systems for record holding	Between Groups	7.255	2	3.627	1.677	.189
		Within Groups	460.671	213	2.163		
		Total	467.926	215			
	Drones	Between Groups	78.006	2	39.003	15.934	<.001
		Within Groups	526.274	215	2.448		
		Total	604.280	217			
	Big data	Between Groups	30.626	2	15.313	5.231	.006
		Within Groups	629.374	215	2.927		
		Total	660.000	217			
	Virtual reality	Between Groups	6.241	2	3.120	2.992	.052
		Within Groups	222.130	213	1.043		
		Total	228.370	215			
	Augmented reality	Between Groups	.765	2	.382	.124	.884
		Within Groups	673.425	218	3.089		
		Total	674.190	220			
	Online training platforms (e.g. mico-credential or MOOCs)	Between Groups	16.322	2	8.161	3.017	.051
		Within Groups	584.372	216	2.705		
		Total	600.694	218			
	Mobile Apps	Between Groups	7.134	2	3.567	.617	.541
		Within Groups	1272.426	220	5.784		
		Total	1279.561	222			
Q18 I am able to shift rapidly from business-as-usual to respond to a crisis		Between Groups	1.803	2	.901	1.286	.279
		Within Groups	152.125	217	.701		
		Total	153.927	219			
Question 21 Please select the level of confidence that best reflects your business situation: I have a business continuity strategy for	Staff	Between Groups	4.250	2	2.125	4.118	.018
		Within Groups	111.458	216	.516		
		Total	115.708	218			
	Premises	Between Groups	4.770	2	2.385	1.492	.227
		Within Groups	340.563	213	1.599		
		Total	345.333	215			
	Technology & ICT	Between Groups	2.918	2	1.459	1.021	.362
		Within Groups	308.489	216	1.428		
		Total	311.406	218			
	Knowledge Management	Between Groups	7.382	2	3.691	2.422	.091
		Within Groups	329.203	216	1.524		
		Total	336.584	218			
	Suppliers	Between Groups	7.615	2	3.808	2.330	.100
		Within Groups	351.417	215	1.634		
		Total	359.032	217			
	Other Stakeholders	Between Groups	1.134	2	.567	.429	.651
		Within Groups	277.354	210	1.321		
		Total	278.488	212			
Q23 Please select the most appropriate response for the		Between Groups	3.068	2	1.534	1.001	.369
		Within Groups	332.369	217	1.532		

			Sum of Squares	df	Mean Square	F	Sig.
following statements: My senior management & operational management teams are trained in business continuity and managing incidents		Total	335.436	219			
Q24 My organisation has a strong culture that provides direction for staff in a crisis		Between Groups	5.012	2	2.506	2.732	.067
		Within Groups	199.074	217	.917		
		Total	204.086	219			
Q25 My staff have the information and knowledge they need to respond to unexpected problems		Between Groups	7.852	2	3.926	6.857	.001
		Within Groups	124.235	217	.573		
		Total	132.086	219			
Q33 I am fully aware of the following essential services within my business area	Emergency services (i.e. police service, ambulance service, fire station, state emergency service)	Between Groups	13.942	2	6.971	4.364	.014
		Within Groups	343.416	215	1.597		
		Total	357.358	217			
	Medical facilities (i.e. hospital/health services)	Between Groups	15.548	2	7.774	4.730	.010
		Within Groups	351.733	214	1.644		
		Total	367.281	216			
	Federal government operations (i.e. the Defence Force)	Between Groups	6.707	2	3.354	2.713	.069
		Within Groups	265.806	215	1.236		
		Total	272.514	217			
	Neighbourhood safer places (a local open space or building where people may gather as a last resort to seek shelter from a bushfire)	Between Groups	6.350	2	3.175	1.796	.168
		Within Groups	380.017	215	1.768		
		Total	386.367	217			
	Big data mapping of high risk areas	Between Groups	11.498	2	5.749	4.425	.013
		Within Groups	276.706	213	1.299		
		Total	288.204	215			
	Drone operators for crisis recovery efforts	Between Groups	.252	2	.126	.145	.865
		Within Groups	186.468	215	.867		
		Total	186.720	217			
Q34 Please select the	Building a culture of	Between Groups	12.247	2	6.123	5.078	.007
		Within Groups	256.860	213	1.206		

			Sum of Squares	df	Mean Square	F	Sig.
response that best reflects your business: I am confident that my business has been actively involved in the following activities	prevention and preparedness	Total	269.106	215			
	Integrating resilience into disaster plans	Between Groups	9.082	2	4.541	3.460	.033
		Within Groups	278.248	212	1.312		
		Total	287.330	214			
	Having pre-disaster trainings and/or simulations	Between Groups	3.844	2	1.922	1.250	.289
		Within Groups	327.471	213	1.537		
		Total	331.315	215			
	Having sufficient knowledge on hazard management	Between Groups	6.329	2	3.164	2.025	.135
		Within Groups	332.889	213	1.563		
		Total	339.218	215			
	Establishing clear lines of responsibility	Between Groups	9.820	2	4.910	3.325	.038
		Within Groups	314.550	213	1.477		
		Total	324.370	215			
	Having early warning systems in place	Between Groups	8.169	2	4.085	2.492	.085
		Within Groups	349.146	213	1.639		
		Total	357.315	215			
	Using ICT in our crisis response	Between Groups	5.029	2	2.515	1.392	.251
		Within Groups	384.804	213	1.807		
		Total	389.833	215			
	Offering regular staff training in crisis responses	Between Groups	6.529	2	3.265	1.931	.148
		Within Groups	360.063	213	1.690		
		Total	366.593	215			
	Conducting regular evacuation drills with staff	Between Groups	8.979	2	4.490	2.985	.053
		Within Groups	320.349	213	1.504		
		Total	329.329	215			

The table below presents the ANOVA analysis results for company history comparison.

i. less than 4 years

ii. 5-9 years

iii. > 10 years

			Sum of Squares	df	Mean Square	F	Sig.
Question 8 I am mindful of how a	Natural disaster will impact my business	Between Groups	1.917	2	.959	2.607	.076
		Within Groups	83.831	228	.368		
		Total	85.749	230			
	Health related disaster will impact my business	Between Groups	2.950	2	1.475	5.053	.007
		Within Groups	67.128	230	.292		
		Total	70.077	232			
	Cyber-crime will impact my business	Between Groups	2.844	2	1.422	3.303	.039
		Within Groups	99.036	230	.431		
		Total	101.880	232			
	Financial disaster will impact my business	Between Groups	1.754	2	.877	3.311	.038
		Within Groups	60.660	229	.265		
		Total	62.414	231			
	Political crisis will impact my business	Between Groups	6.020	2	3.010	6.575	.002
		Within Groups	104.837	229	.458		
		Total	110.858	231			
	Other minor crisis (e.g. a localized power outage in your business or the flooding of the laundry facilities) may impact my business	Between Groups	1.852	2	.926	1.349	.262
		Within Groups	157.247	229	.687		
		Total	159.099	231			
Question 10 I believe crisis management plans must be	practiced to be effective	Between Groups	.062	2	.031	.112	.894
		Within Groups	63.438	229	.277		
		Total	63.500	231			
	tested to be effective	Between Groups	4.169	2	2.085	7.780	<.001
		Within Groups	60.826	227	.268		
		Total	64.996	229			
	regularly updated to be effective	Between Groups	1.296	2	.648	2.820	.062
		Within Groups	52.597	229	.230		
		Total	53.892	231			
Question 16 Please give an example of the most useful example of using technology in your crisis preparedness, response and/or recovery efforts (one being the least useful and	Social media	Between Groups	51.490	2	25.745	9.343	<.001
		Within Groups	609.010	221	2.756		
		Total	660.500	223			
	Cloud based computer systems for record holding	Between Groups	18.709	2	9.354	4.166	.017
		Within Groups	487.269	217	2.245		
		Total	505.977	219			
	Drones	Between Groups	32.139	2	16.069	5.781	.004
		Within Groups	608.748	219	2.780		
		Total	640.887	221			
	Big data	Between Groups	115.443	2	57.722	22.732	<.001
		Within Groups	553.552	218	2.539		
		Total	668.995	220			
	Virtual reality	Between Groups	17.801	2	8.901	8.354	<.001

			Sum of Squares	df	Mean Square	F	Sig.
8 being the most useful)		Within Groups	230.126	216	1.065		
		Total	247.927	218			
	Augmented reality	Between Groups	15.175	2	7.587	2.490	.085
		Within Groups	673.321	221	3.047		
		Total	688.496	223			
	Online training platforms (e.g. mico-credential or MOOCs)	Between Groups	24.372	2	12.186	4.500	.012
		Within Groups	595.718	220	2.708		
		Total	620.090	222			
	Mobile Apps	Between Groups	249.343	2	124.672	26.771	<.001
		Within Groups	1043.159	224	4.657		
		Total	1292.502	226			
Question18 I am able to shift rapidly from business-as-usual to respond to a crisis		Between Groups	2.941	2	1.470	2.117	.123
		Within Groups	154.188	222	.695		
		Total	157.129	224			
Question 21 Please select the level of confidence that best reflects your business situation: I have a business continuity strategy for	Staff	Between Groups	3.571	2	1.785	3.406	.035
		Within Groups	115.317	220	.524		
		Total	118.888	222			
	Premises	Between Groups	62.406	2	31.203	23.832	<.001
		Within Groups	284.121	217	1.309		
		Total	346.527	219			
	Technology & ICT	Between Groups	61.118	2	30.559	26.706	<.001
		Within Groups	251.743	220	1.144		
		Total	312.861	222			
	Knowledge Management	Between Groups	65.880	2	32.940	26.299	<.001
		Within Groups	275.555	220	1.253		
		Total	341.435	222			
	Suppliers	Between Groups	88.371	2	44.186	35.478	<.001
		Within Groups	272.751	219	1.245		
		Total	361.122	221			
	Other Stakeholders	Between Groups	44.957	2	22.478	20.424	<.001
		Within Groups	235.522	214	1.101		
		Total	280.479	216			
Question 23 Please select the most appropriate response for the following statements: My senior management & operational management teams are trained in business continuity and managing incidents		Between Groups	37.241	2	18.621	13.151	<.001
		Within Groups	314.341	222	1.416		
		Total	351.582	224			
Question 24 My organisation has a strong culture that provides direction for staff in a crisis		Between Groups	10.287	2	5.144	5.643	.004
		Within Groups	202.353	222	.911		
		Total	212.640	224			
Question 25 My staff have the information and knowledge they need to respond to unexpected problems		Between Groups	5.337	2	2.668	4.254	.015
		Within Groups	138.623	221	.627		
		Total	143.960	223			
Q33 I am fully aware of the following essential services within	Emergency services (i.e. police service, ambulance service, fire station, state emergency service)	Between Groups	82.390	2	41.195	32.104	<.001
		Within Groups	281.016	219	1.283		
		Total	363.405	221			
	Medical facilities (i.e. hospital/health services)	Between Groups	81.568	2	40.784	30.693	<.001
		Within Groups	288.341	217	1.329		

			Sum of Squares	df	Mean Square	F	Sig.
my business area		Total	369.909	219			
	Federal government operations (i.e. the Defence Force)	Between Groups	24.328	2	12.164	10.528	<.001
		Within Groups	251.862	218	1.155		
		Total	276.190	220			
	Neighbourhood safer places (a local open space or building where people may gather as a last resort to seek shelter from a bushfire)	Between Groups	71.310	2	35.655	24.618	<.001
		Within Groups	315.731	218	1.448		
		Total	387.041	220			
	Big data mapping of high risk areas	Between Groups	44.373	2	22.187	19.307	<.001
		Within Groups	248.211	216	1.149		
		Total	292.584	218			
	Drone operators for crisis recovery efforts	Between Groups	7.448	2	3.724	4.526	.012
		Within Groups	179.358	218	.823		
		Total	186.805	220			
Q34 Please select the response that best reflects your business: I am confident that my business has been actively involved in the following activities	Building a culture of prevention and preparedness	Between Groups	35.906	2	17.953	16.440	<.001
		Within Groups	235.875	216	1.092		
		Total	271.781	218			
	Integrating resilience into disaster plans	Between Groups	39.458	2	19.729	16.927	<.001
		Within Groups	250.583	215	1.166		
		Total	290.041	217			
	Having pre-disaster trainings and/or simulations	Between Groups	59.868	2	29.934	23.637	<.001
		Within Groups	273.539	216	1.266		
		Total	333.406	218			
	Having sufficient knowledge on hazard management	Between Groups	73.575	2	36.788	29.678	<.001
		Within Groups	267.749	216	1.240		
		Total	341.324	218			
	Establishing clear lines of responsibility	Between Groups	62.018	2	31.009	25.332	<.001
		Within Groups	264.402	216	1.224		
		Total	326.420	218			
	Having early warning systems in place	Between Groups	62.131	2	31.066	22.556	<.001
		Within Groups	297.494	216	1.377		
		Total	359.626	218			
	Using ICT in our crisis response	Between Groups	78.509	2	39.254	27.004	<.001
		Within Groups	313.993	216	1.454		
		Total	392.502	218			
	Offering regular staff training in crisis responses	Between Groups	72.776	2	36.388	26.657	<.001
		Within Groups	294.850	216	1.365		
		Total	367.626	218			
	Conducting regular evacuation drills with staff	Between Groups	56.333	2	28.167	22.225	<.001
		Within Groups	273.749	216	1.267		
		Total	330.082	218			

Appendix III – Mandate for action

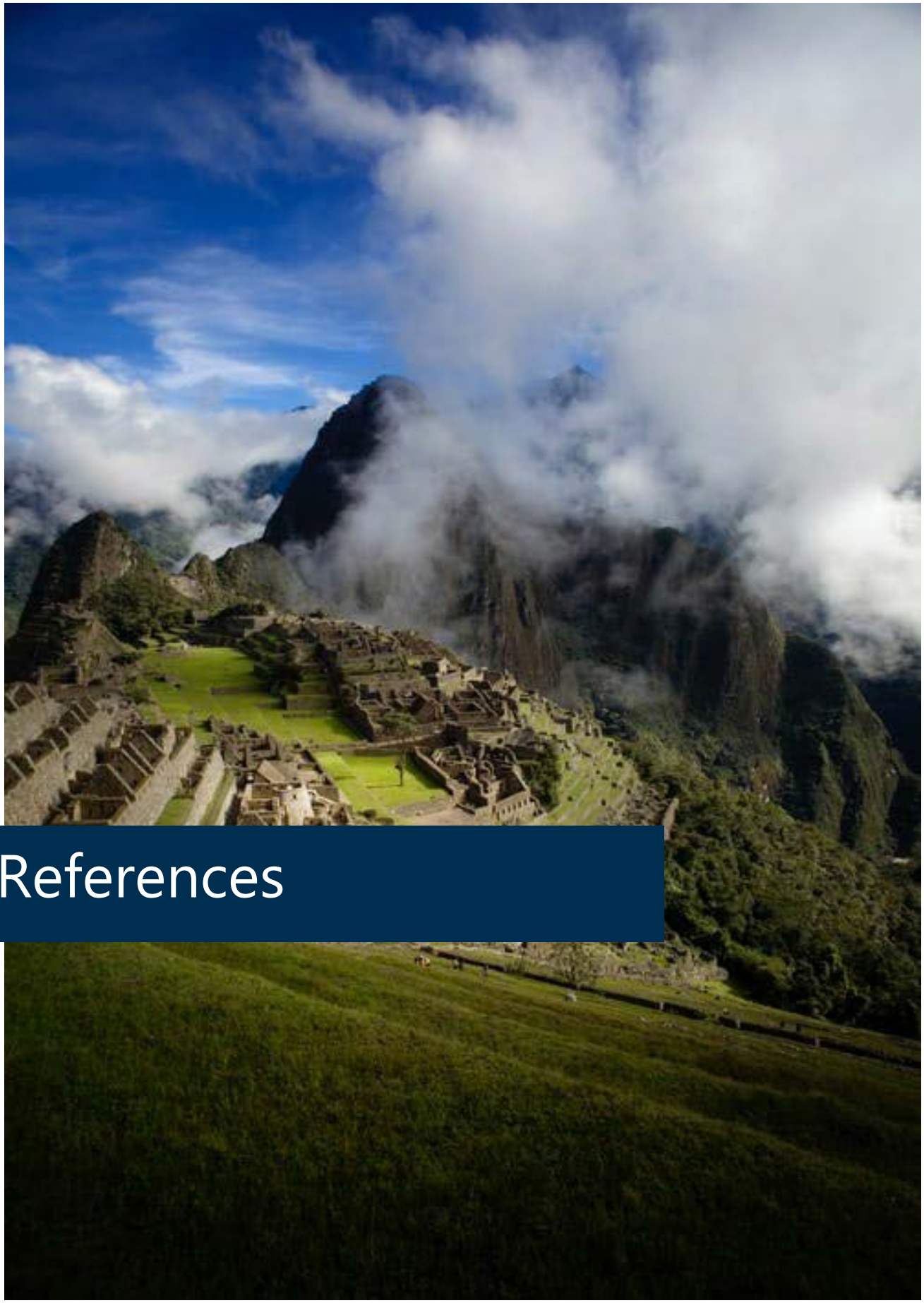
The following is a template to mandate preparedness action within MSMEs:

Every year Australian communities are subjected to the damaging impacts of emergencies and disasters. The effects of these events on people experiencing disadvantage and the organizations who work with them serve as a reminder of our need to continuously strengthen our resilience. Building the preparedness of our organisation for disasters and emergencies is a priority because we are committed to delivering vital _____ services to our community. Our clients are _____ and our services extend to _____ areas. We recognize that if our organisation is put under strain or ceases operation because of an emergency then our clients will be impacted. They will lose important services just at the time when they themselves may be suffering acute difficulty because of the emergency. Though emergencies and disasters may be infrequent, our services are especially important before, during and after an emergency because many of our clients are beyond the reach of other services; we provide an essential lifeline of support. Furthermore, we appreciate that climate change may make extreme weather events more severe and more frequent. We therefore recognize that preparedness for extreme weather events is a priority for us and our clients.
Source: Resilient Community Organizations, Six Steps to Resilience - https://resilience.acoss.org.au/the-six-steps/leading-resilience/leadership-for-disasters-and-emergencies

Appendix IV - Barriers and opportunities for digital transformation

The OECD's Preparing tourism businesses for a digital future (48), identifies the following issues, barriers and opportunities in digital transformation.

Issue	Barrier	Opportunity
Uptake of technologies	• Lack of access to digital infrastructure can slow digitalization processes • Lack of availability of high speed broadband in regional and rural areas can impede business operations • Lack of availability of high speed Wi-Fi connection can impede visitor experience innovation	• Innovation and customization of products, services and experiences increases visitor satisfaction • Increased connectivity facilitates scaling, market reach, product and service innovation
Access to resources	• Lack of access to capital or eligibility to apply for traditional loan products • Absence of skills and expertise and lack of resources to support skills development and training	• Co-operative funding initiatives reduce initial costs and reduce perception of risk • Policy supports where technologies can be trialed, costs shared, and network support developed
Information exchange, learning and research	• Restructuring of workforce – fewer frontline jobs and demand for ICT expertise growing • Demand for new skill sets may not be available and SMEs may not have resources to employ experts and consultants	• Collaborative programs incentivise universities to work with business and government toward digital transformation • Technologies enhance production of data driven business planning
Business innovation	• Business models, culture and practices influence willingness to transform • Data Protection Regulations (e.g. EU) and privacy requirements exacerbate the challenge of data collection, analysis and storage • Lifestyle and micro-businesses tend to be risk averse	• Incubators, accelerators labs that encourage collaboration between tech and tourism companies improve openness to innovation • Enhancing the focus on travel-tech as opposed to the process of building a start-up will benefit tourism
Perceptions of risk and benefits	• Uncertain benefits, fear and anxiety of the unknown in relation to costly or novel technologies • Demands of day-to-day operations take away from strategic management and create time pressures	• Demonstration projects that provide hands-on awareness raising of the benefits of digital technologies • Timely and evidence-based decision-making from enhanced data collection and analytics



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