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Strengthening Destinations' Resilience from Bushfires—A Study of Eastern Australia

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Abstract

Climate change has brought people's attention in recent decades, which demonstrates a critical phenomenon of increased natural disaster risks. The consequences of natural hazards are highly potential to bring significant economic, reputational, social, and environmental impacts on Australia's tourism industry. Considering the close relationship between the unique natural environment and the local tourism industry, natural disasters always play critical roles in terms of the destinations' resilience. This paper aims to examine the cause-and-effect of natural disaster resilience for the tourism industry in Eastern Australia with the particular concern of bushfire. Representative bushfire events will be studied to locate the industry's preparedness and the existed action gaps mainly with the focus on government and destination management organizations, as well as discuss the disaster prevention implications, direct/indirect impacts and tourism-related issues. Also, a natural disaster resilience assessment framework for the industry will be developed with the key indicators from multiple aspects. A couple of future directions will be proposed regarding recovery methods, including the needs of destination image recovery, supportive policies for small businesses and cross-functional partnership.

Keywords: natural disasters, resilience, sustainable tourism, Australia bushfire

1. Background

It is recognised that climate change has triggered an increasing phenomenon in the frequency and severity of extreme weathers such as heatwave/drought, bushfire and cyclone/floods (RossellóR, Becken, & Santana-Gallego, 2020). The impacts of natural disasters on social development and human activities have led to calls for improving disaster resilience, meaning households, communities, and businesses' capacity to cope with and adapt to natural hazards' shocks and stresses (Ruane, 2020). Among the multiple natural disasters happen around Eastern Australia, it is evident that bushfire always causes the most significant loss of natural capital and tend to have long-term impacts on the ecosystem and nearby societies. Tourism, an industry that highly relies on weather and natural resources, is significantly sensitive to the challenges brought by environmental risks (Siddiqui & Imran, 2019). Therefore, it is worthy of note that the industry is highly nature-based and depending on various natural assets. To enhance regional tourism resilience and improve destinations' restoration capabilities regarding the consequences of natural hazards, both the government and community are expected to better understand the major natural disasters regarding the characteristics and impacts (Pyke, De Lacy, Law, & Jiang, 2016).

Based on Köppen-Geiger climate classification, Queensland climate can be categorised into six major climate zones—the equatorial, tropical, subtropical, grassland, temperate, and dessert. The unique landscapes attract a considerable number of visitors, but the natural disasters caused by severe climate event is an unavoidable challenge for the development of the tourism industry. In 2019 and 2020, Queensland encountered several extreme weather conditions – the rainfall of the northeast tropical area was above average, while the continuous sunny weather and delayed onset of Australia monsoon made the inland regions experiencing high temperature and dryness. Moreover, bushfires around the Eastern Coast caused catastrophic consequences such as the Blue Mountain (New South Wales, 2019) and Fraser Island (Queensland, 2020) tragedies.

Being recognized as part of the broader concept of resilience, disaster resilience is the ability of individuals and

communities as well as their institutions to absorb and recover from shocks, while positively adapting or transforming their structures and means for living in the face of long-term changes and uncertainty (UNISDR, 2005). Some researchers see vulnerability as the opposite of disaster resilience, while others view it as a risk factor and resilience mobility as the capacity to respond (Pyke, Law, Jiang, & Lacy, 2018). Besides, according to the Australian Natural Disaster Resilience Index, disaster resilience can be defined as communities' capability to prepare for, absorb and recover from natural hazard events and the capacity to learn, adapt, and transform towards resilience.

2. Bushfires in Eastern Australia

Bushfires happen when unmanaged or managed, live or dead vegetation are ignited and burnt in conservation areas, national parks, personal properties and wildlife reserves, which are most likely to occur during scorching, dry weather and intensified by strong dry wind, fuels and topography (Queensland Fire and Emergency Services, 2017). The higher the temperature, the lower the humidity, and the occurrence and continuity of drought are more likely. It could also be triggered by some human activities or natural reasons such as heatwaves, lighting strikes, and sparks from a rockfall. The Bureau and Emergency Services uses six fire danger ratings to communicate the bushfire risk level, including low-moderate, high, very high, severe, extreme and catastrophic. Any bushfires at a higher rating are likely to be fast-moving and difficult to control. There is a strong link between fires and climate conditions. Climate change worsens the conditions, making fires to start earlier and end later. The Forest Fire Danger Index also shows that "serious" and "major" fire seasons are becoming much more common. Although the number of fire spots may remain equable, the impacts are anticipated to be worsening at present and in the future.

The overall consequence of bushfire is various, including loss of life (both human and wildlife), infrastructure damage, agriculture/livestock costs and ecosystem risks (Markwell, 2020). One of the most significant fires, Victoria's Black Saturday in 2009, caused about $4.4 billion economic costs. Other losses include the damage to historical sites, scientific facilities, biodiversity, and communities' psychological and destination's public reputation (Genç, 2018). Across September 2019 and March 2020, the devastating bushfire season demonstrated the ecosystem's vulnerability to global warming, which also left an image that the country is not safe for visitors. The nation's tourism industry, especially in the east coast, was negatively impacted due to the long-term recovery needs. To deal with the issues regarding community and tourism industry resilience, the Prime Minister and the Minister for Trade Tourism and Investment of Australia have acknowledged the importance of tourism industry recovery and pledged to rebuild Australian tourism with a series of funding and initiatives (Australian Government, 2020).

Overall, the increasing temperature and unstable atmospheric conditions lead to more frequent extreme weathers. When the high temperature meets low rainfall conditions, it causes drought/heatwave and creates an advantageous bushfire condition. Apparently, if drought/heatwave sustains longer, it slows the regeneration of vegetation. The greenhouse gas emissions produced by bushfire and the decreased carbon bank could also aggravate global warming. Furthermore, the weather condition leads to more tropical lows, and atmospheric blocking is able to increase the severity of tropical cyclones, which is also likely to bring heavy rainfalls and may form floods accordingly. The close connections of natural disasters and climate change makes resilience and recovery work more complicated, and the phenomenon needs to be seen as a whole system rather than individual crises.

3. Australia's Bushfire Cases

Starting from June 2019 with multiple 'mild' fires, the 2019–2020 Australian bushfire season (also be known as the Black Summer) continued for months and finally became a world-focused catastrophic disaster. Bushfire in this country is a regularly occurring natural event, which is believed to be one of the most fire-prone regions globally (Williams & Vandenbeld, 1988). The fires always start from soft spots, which is a great chance to stop it before the fire gets prominent as most fires can be prevented at early stages (Climate Council, 2019). However, with several severe fires spread from November 2019, things got out of control and significantly affected the nation's economic activities including the travel and tourism industry.

Table 1. Basic information of 2019–2020 bushfire season in Australia

Time	Jun 2019 to Mar 2020
Affected regions	Australian national wide
Burnt area	More than 20% of Australia's forests
Losses	$4.5 billion holidays cancel; Buildings destroyed more than 9,352, including over 3,500 homes and 5,852 outbuildings; 1.25 billion animals killed
Fatality	34 direct + 417 excess from smoke inhalation
Secondary disasters	Heavy rainfall and storm, high winds, soil erosion, heatwave & drought; Chain reactions to global warming and secondary disasters

Apart from the common factors including weather, terrain, oxygen, and vegetation which act as fuel for the rising of fire, the 2019–2020 Australian bushfire season resulted from the combination of natural factors and human activities. It started from mild fire spots caused by lightning strikes and human behaviours in forestry areas, such as discarded burning cigarette butts and alleged arson from camping/picnic barbecuing (Ryan, 2020). The fires then were enhanced by adverse natural conditions like widely distributed combustible eucalyptus, heatwave influences and low rainfall (UNWTO, 2020). Additionally, the positive Indian Ocean Dipole (IOD), also known as Indian Nino, is a critical factor to blame for Australia's early drought and bushfire season (Ceranic, 2019). IOD is usually triggered by the changing seawater temperature and impacts weather patterns like El Nino/La Nina in the Pacific. The unnormal long-term dryness and extreme heat linked with IOD effects can also be regarded as the strengthening elements for the 2019–2020 bushfire.

The further consequences and secondary disasters resulting from this fire season are even more complex. Firstly, climate change and natural disasters are interlinked with each other, which means the fire season was caused by climate change but also reinforced and accelerated the progress of climate change with the significant emission of carbon dioxide (Gramling, 2020). Data shows that the production of CO_2 from the fires was equivalent to the sum of annual emissions of the 161 countries with the lowest greenhouse emissions in the world, which was even more than Australia's usual annual carbon emissions (Morton, 2020). In early 2020, it was noticed that the smoke and dust from the Australia bushfire crossed the ocean and covered the whole southland of New Zealand with yellow sky and smoke-smelling air (MacManus, 2020). The smoke was later detected approximately 11,000 kilometres away from Australia, around the territories of South America, including Chile, Argentina and Brazil. Moreover, the increasing temperature caused by global warming also led to high evaporation and seawater acidification, damaging the marine ecosystem by the consequences of coral bleaching and decreased marine biodiversity.

Considering the tourism sector, the tourists, especially those from overseas, were scared by the mass evacuation, destroyed natural attractions and downgraded air quality, and cancelled their trip plans including hotel and flight bookings (Chalmers, 2020). The majority of the holiday cancellations were from Australia's key tourist markets, the US, UK, and China (Thiessen, 2020), which cost the industry approximately $4.5 billion related to the tourists' concern of safety issues and the uncertainty of destinations' recovery (Carruthers, 2020). The fires also damaged infrastructures, historical sites and hotels/resorts. For example, a historical heritage accommodation, Binna Burra Lodge in the Gold Coast hinterland (Sapwell, 2019), was almost destroyed. Moreover, there were mass losses of natural resources, like wildlife species and forestry vegetation, which needed a long time for the natural habitats to recover. The United Nations' research showed that more than 18 billion hectares had been burnt as of January 2020, along with approximately millions of animals been killed (UNEP, 2020). With a vast amount of flora and fauna destroyed, experts suggested the affected ecosystem may needs centuries to be fully recovered (Claughton, 2020). Since natural resources are recognised as the top attractions for Australia's tourism industry, the damaged wildlife and vegetation, and the worsening air condition significantly affected the quality of tourism experiences (Wilks, 2020). Even the major fires were not happening in big cities, the floating smoke and dust still impacted Brisbane (Pollard, 2019) and Sydney's (Taylor, 2019) usual socioeconomic activities. The national and regional destination images of Australia was affected due to certain burnt areas' international exposures (Schweinsberg, Darcy, & Beirman, 2020).

To further understand the issues regarding regional natural disaster resilience issues and tourism-related impacts, this paper focuses on the Blue Mountains in New South Wales, due to the area's important status in Australia's tourism industry. Another extreme fire case study looks into the Fraser Island, Queensland, which discusses the current gaps regarding the industry's resilience to bushfires.

3.1 The Blue Mountains, New South Wales

As a unique world heritage site, the Blue Mountains has a special status of being a popular tourist destination in New South Wales. With the distinguishment of its environmental and socio-geographic characteristics, 70% of the region was acknowledged as part of the World Heritage Blue Mountains National Park (RFS). During the fire season, Sydney also suffered certain degrees of the consequences considering the Blue Mountain's proximity to the city. Visitors who plan to visit the Blue Mountains are likely to stay in Sydney; therefore, if the national parks were damaged and lost future tourists, the city's tourist markets could be affected as well. The fires and dust produced by the forests' fires would certainly float to the cities and downgrade the tourist experiences and satisfaction level.

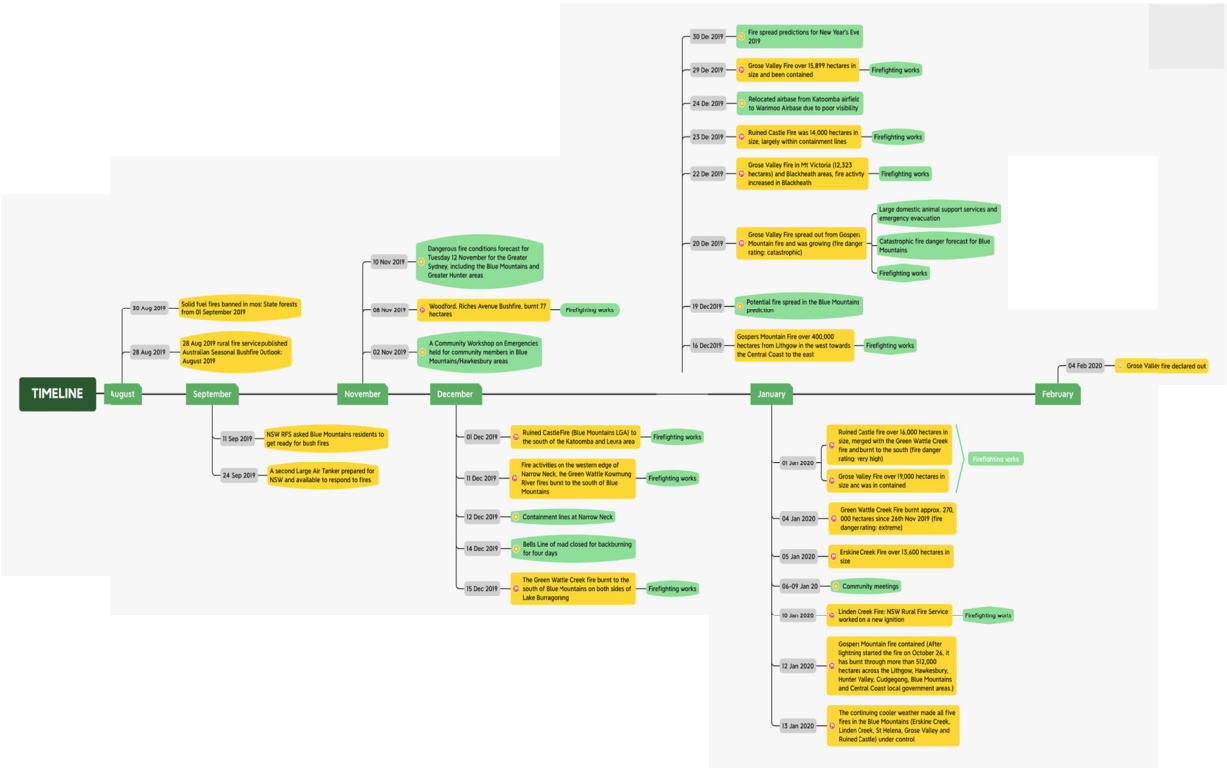

Figure 1. Timeline of the major fire events and actions, the Blue Mountains fire, 2019

With the consideration of forecasted dryness and the above normal warm weather conditions, the Bushfire and Natural Hazard Cooperative Research Centre and Australian National Council for Fire and Emergency Services (AFAC) had warned the east coast of New South Wales, Queensland, Victoria, Tasmania and Australia Capital Territory in August 2019 about the high potential of active bushfire season. However, by analysing the timeline of the fire events that happened around the Blue Mountains region (Figure 1), it is assumed that the local rural fire service had the issue of formalism—the communities had already noticed the potential danger of seasonal fire; however, there was few actions except for some community meetings and equipment preparation. Since bushfire is a familiar natural event and the communities had been getting used to it, the fire started early before August 2019 and continued burning without enough attention. Finally, fires became significant and different spots started to emerge with each other and became uncontrollable.

Statistics indicate that more than 80% of the Blue Mountains' world-heritage listed areas were lost (Australian Associated Press, 2020). According to the executive director of the Blue Mountains World Heritage Institute, John Merson, 366,500 hectares of subtropical rainforest heritage distributed across NSW and QLD has been devastated, along with badly reduced eucalypt diversity (Cox & Evershed, 2020). A research shows that about one-third of NSW's koalas (about 8,000) were estimated been killed by the fire, with a loss of 30% of the koala's natural habitat (UNSW, 2020). Moreover, some wildlife rescue groups witnessed the enormous heart-broken loss of possums, kangaroos, wallabies, reptiles and platypus (Claughton, 2020). The fire even quickly reached close to Sydney (35–40 miles northwest), by the most severe fires merged into a massive complex in December 2019,

when the air quality index broke 300 (Cappucci & Freedman, 2019).

In February 2020, the east coast of NSW and the Blue Mountains regularly opened for businesses and were recovered naturally, yet the market did not come back. According to the co-owner of the new Jervis Bay Brewing Company (an NSW based beer house), "the whole area is screaming for people to come back" (Hennessy, 2020). A bus tour operator in NSW commented, "In 45 years, I have never seen any downturn like this" (Chalmers, 2020). Meanwhile, many nations upgraded travel alerts for Australia, such as the US (Whinnett, 2020), making the tourism industry harder to turn back to normal. The local tourism operators also lost their businesses due to direct impacts from the fire. For instance, during the Christmas and New Year's break, thousands of tour operators were forced to evacuate from the south coast of NSW (Hennessy, 2020). Moreover, a popular attraction of the Blue Mountains, Scenic World, lost 50% visitors (50,000 fewer) in December 2019 compared to 2018, while the number of visitors climbing the Sydney Harbour Bridge declined 15–20%. A staff of the Blue Mountains Backpacker Hostel in Katoomba complained that the number of busloads customers had fallen from 20 to 4 on a daily average (AusLeisure, 2020).

3.2 The Fraser Island, Queensland

Though Australia's overall bushfire situation has become relieved after the 2019-2020 bushfire season, there were still occasionally happened fires around the east coast caused by both human activities and natural conditions. In October 2020, tourists set campfire illegally in the Fraser Island, which became a big blaze lately and destroyed approximately 1/2 of the World Heritage Listed sand island (more than 87,000 hectares) within the next two months. Located off the eastern coast of Queensland, Fraser is the world's largest dune island with unique ecosystems and was designated as UNESCO Biosphere Reserve and Ramsar site (Feng, 2020). It has impressive inland rainforest of Kauri pines, giant ferns, and turpentine trees that may live for thousands of years. Due to the precious environment, Fraser Island is the habitat of diverse species, from native birds to flying foxes, skinks, sea turtles, and wild dingoes (Welch, 2020). The fire negatively affected the Island's tourism market and damaged considerable natural resources. It threatened and damaged the rainforests, trees growing in the sand and with a maximum height of 150 metres. Although winds did not force the fire to get worse, the slow movement was still horrible and showed how big it was. Since the authorities were struggling to control the significant fires, visitors and tour operators were told to stay away from Fraser Island and the businesses were shut temporarily. Although the tourism businesses on the Island are limited, it is still critical for both the government and the industry to think more about visitor management issues regarding tourism behaviour intervention and disaster-related supportive actions.

As the destination is an isolated semi-primitive island and lacks public infrastructure and transportation systems, the fire control works were facing a struggle which made it missed the best opportunities. Later, when the fire management works became a big problem, the national legislation sides, including the federal Environment Department started cooperating with Queensland Fire and Emergency Services for fire controlling and damage assessment works and finally contained the significant fires in mid-December (Dennien, 2020). The fires have been provoked by the extended winter dry season warmed by climate change. Apparently, the following heatwave and drought situations associated with the consequences of the previous bushfire also increased the risks of more fires, which could enhance the harmful effects of this chain reaction. This change could make the vegetation grow faster so that the fires get uncontrollable fast before been noticed (Welch, 2020). The following rainy season relieved the fire situation a lot; however, it still caused soil erosion to scour heavy rainfall, and the floods washed the fragile land surface (Paul & Barrett, 2020). It was also reported that the Great Barrier Reef experienced the third mass coral bleaching in the last five years, which was believed to be one more consequence of the catastrophic bushfire due to the reinforcements of global warming (The Climate Council, 2020).

Similar to the trigger of the tragic Binna Burra fire in 2019 that was possibly started by a cigarette butt, visitors' action was also blamed for the Fraser Island fire in 2020. Meanwhile, the related governmental departments' actions were also criticised in terms of their work efficiency and effectiveness. Voices blamed the state government and the Queensland Parks and Wildlife Service for a perceived delay in escalating efforts to fight the bushfires. In order to stop fire spreading, reinforcements were sent to consolidate the control lines across the Island due to the expected wind direction changes.

3.3 The Gap Between Supportive Practices and Industry's Needs

Table 2. Some of the keys that supports the tourism sector during the 2019–2020 bushfire

	Title	Details	Focus
Direct financial supports for business recoveries	National Bushfire Recovery Fund (Note 1)	Initial $76 million tourism recovery package to protect jobs, small businesses and local economies	Tourism
	Indigenous Business Australia Bushfire Crisis Support (Note 2)	Up to $2,000 grants for businesses and homes directly impacted.	Indigenous business & households
	NSW Business Connect program (Note 3)	$14 million for training and business consultations to help SMEs stay resilience and grow	Overall business
	NSW Bushfire Recovery Grant for directly-impacted small businesses (Note 4)	Up to $50,000 each eligible applicant for small business or non-profit organisation only	Overall business
	NSW Small Business Bushfire Support Grant (Note 5)	Up to $10,000 each eligible applicant	Overall business
	Small Business Bushfire Information Session (Note 6)	Bushfire support consultation and workshops hosted by NSW Treasury	SMEs
Leveraging & Destination Management	Regional tourism events initiative	$10 million for events, concerts, festivals, exhibitions, and/or other sustainable attractions	Tourism & Events
	Australian Tourism Exchange	$6.5 million for Tourism Australia to source more businesses and buyers in 2020 by creating new discounts or incentive structures	
	Mobilising the global network	$5 million for the maintenance and improvement of Australia's diplomatic network	
Marketing Campaign & Public Relations	Domestic marketing campaign	$20 million, encourage interstate & intrastate tourists and support the affected communities. Partner: Tourism Australia	Tourism industry
	International marketing campaign	$25 million, spread the message that Australia is now safe and ready for tourism businesses. Partner with the whole industry and international travel partners	
	International Media Hosting	$9.5 million for Tourism Australia's International Media Hosting Program to attract international media	

Note. 1. Source: https://www.pm.gov.au/media/rebuilding-australian-tourism;
2. Source: https://www.iba.gov.au/bushfire-crisis-support/;
3. Source: https://www.ragtrader.com.au/news/14-million-funding-boost-for-nsw-business-connect-program;
4. Source: https://www.service.nsw.gov.au/transaction/apply-bushfire-recovery-grant-directly-impacted-small-businesses;
5. Source: https://www.service.nsw.gov.au/transaction/apply-small-business-bushfire-support-grant;
6. Source: https://businessinglen.com.au/event/small-business-bushfire-information-session.

The government supported the tourism industry to address with brushfires' impacts by putting 152 billion Australian dollars. Seventy-six million was distributed to local communities' mental health support and job injection in tourism and hospitality. Fifty million were granted for wildlife recovery and habitat restoration. There were also marketing campaigns launched to boost the industry's confidence, including 76 million Australian dollars with 20 million in domestic, 25 million for global marketing and 10 million towards creating new attractions in bushfire affected regions around the country. Regardless of NSW's actions showed by Table 2 and the national supports, there are five main guidelines for funding in Queensland—the Disaster Recovery Funding Arrangements (DRFA), State Disaster Relief Arrangements (SDRA), Natural Disaster Relief and Recovery Arrangements (NDRRA), Queensland Disaster Resilience Fund, and Get Ready Queensland Funding. Each of the guidelines articulates the eligible disasters and application criteria and are divides applicants into several categories, including small businesses, personal hardships, non-profit organisations, communities, government departments and agencies. Resilience funding mainly focuses on infrastructure and non-infrastructure mitigation projects while the Get Ready Queensland fund focuses on building community resilience. All plans are guidelines for local, regional government and community recovery for bushfire impacted areas or regions and each focus on working with local governments and communities to ensure the affected businesses and communities to obtain enough resources. Some other approaches include market campaigns, public awareness campaigns, and reconstruction projects are also distributed to increase tourism confidence after disasters. The highly integrated partnerships between the community and groups at different levels (local, district,

state and Commonwealth levels) are key to achieving ideal outcomes.

Regarding the post-crisis supports, the small and medium enterprises might be struggling with selecting multiple policies, while it is also complicated for assessors to determine the approvals. Sometimes it is hard to carry out the policies smoothly, and those who urgently need assistance may not have the chance. Media reports demonstrated that as of early March 2020, 738 applicants in NSW, VIC and SA applied for the small business-focused relief package, though only 147 were successfully granted, along with 5 out of 104 applicants for concessional loans approved (Keating, 2020). Also, the cluster of mass information might stop the businesses from applying—it is frustrating for people to find out the most suitable offers and the eligibility guides are likely to confuse the applicants. Besides, SMEs' focus needs to be enhanced as they tend to be independent and usually have fewer financial capabilities than big companies. While big businesses attract more attention, SMEs are playing significant roles in providing tourism-related services. If they choose to close their businesses and exit the market because of insurmountable difficulties (incl. financial, social, mental issues), it could become another hit for the destination's recovery. As the federal government also initiated marketing campaign and event leverage programs, the local community and SMEs' involvements also need to be valued to fully achieve the objectives. Moreover, all the recovery plans could be activated only when a certain amount of government expenditure has been exceeded and requires multi-agencies responses, which leads to a lack of attention to small-scale disasters with high frequency. The current practices can also cause a burden for communities with less economic mitigation and recovery resources.

The gaps between the current situation and the ideal implementations are various. Firstly, many tourism operators do not have enough skills, knowledge and resources for natural disaster preparedness and resilience, especially those based in rural areas that usually have less public and government attention. Secondly, the current government-initiated policies and funds should contain sufficient support for small-scale, high-frequency disasters, such as focusing on second disasters and the indirect impacts of bushfire. The lack of a systematic approach for rebuilding destination image is another critical issue of natural disasters associated with the tourism industry, which is also an essential point to invest resources for attracting visitors back after adverse events.

4. Conclusion: The Assessment

There is no doubt that bushfire is a vital disaster for tourism and the overall environment. The chain reactions show that bushfire creates a weather circle associated with other weathers and disasters (The National, 2020), such as rainfall, drought, heatwave and soil erosion. Unfortunately, tourism activities in Eastern Australia strongly rely on the weather and the natural environment. In terms of bushfire's severe consequences, forestry desertification and the decrease of wildlife amount indicate that tourism resilience is likely to be weaker under bushfire damage and its long–term recovery timeframe.

When the bushfire became severe in Australia, another vast fire was happening on the other side of the world—the 2019 Amazon rainforest wildfires. Interestingly, the Amazon regions have similar geographic features (eastern continent), climate classifications (tropical and subtropical zones) and current ocean features (the exchange of cool and warm surface flow) with Australia's east coast. Meanwhile, during August and September 2019, both areas were experiencing dry seasons. The Amazon wildfire should have brought people's attention to Australia's bushfires, but it did not. Although bushfire is part of Australian ecosystem's natural laws, the alert toward destructive fire potential is still necessary.

The criticism is about neglect of public awareness, especially at the early stage. Binna Burra Lodge's tragedy shows that although all crisis management procedures and equipment were prepared and the executive team had the latest fire safety training, the property still did not escape from the disaster (Griffith University, 2019). On Friday, Sept 06 2019, the lodge expected a 100% occupancy rate even though the staff had noticed a fire in the valley several days before. Some forest-based activities were cancelled before that weekend due to the high fire potential, while the lodge had less intention of evacuation until the fire nearly accessed the property. Similar things happened a lot which the fire went out of control and destroyed infrastructures/properties because people did not recognise the danger.

For tourism destinations with wide varieties of natural resources and multiple geographical features, sustainability and tourism resilience depend very much on destination management practices and the adaptation to climate change (UNEP, 2008). As discussed earlier in this paper, the natural disasters in Eastern Australia are connected closely with the effects of climate change. Natural disasters generally result in multiple negative impacts on tourism and damage the destination's economy accordingly. Understanding the interrelationships between extreme weathers and tourism sector could help destinations with managing critical issues and implement recovery, restoration, and marketing practices (RosselloR, Becken, & Santana-Gallego, 2020).

Therefore, facts require the industry to be proactive and consider the cause and effects of global warming regarding the decision-making processes. The recommendations are incorporated with a series of disaster reduction concepts classified by The United Nations Department of Humanitarian Assistance (UN-DHA).

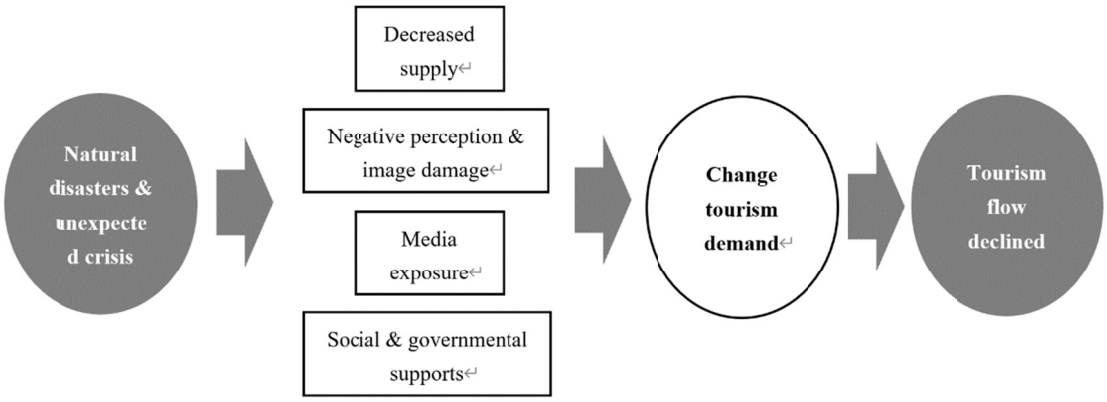

Figure 1. The effects of natural disasters on tourism

Based on the UN-DHA identified crucial mechanisms for practical disaster reduction implementations, this study selects four topics from UNWTO's Handbook on Natural Disaster Reduction in Tourist Areas (1998) to form the evaluation framework: governmental resources, knowledge & skills, restrictions & incentives. Importantly, as the UNWTO's handbook was published two decades ago, the current situation of the development of globalisation and integrated marketing communication (IMC) need to be considered within the scope of tourism resilience. Therefore, this paper brings a framework consisted of governance & resources, knowledge & skills, restrictions & incentives, and communication & partnership (Table 3). The current practices of regional tourism resilience will be evaluated based on this framework and the previous assessment of the existing gap.

Table 3. Tourism resilience evaluation framework

Topic	Some Key Indicators
Governance & Resources	Any inappropriate policies
	Government's commitment and the leadership roles
	Key public infrastructure reconstruction
Knowledge & Skills	Public awareness of natural disasters
	Community participation (crisis prevention)
	Training & education programs about natural disasters for tourism operators and the effectiveness
	Equipment and technical supports for natural disaster resilience
Restrictions & Incentives	Financial initiatives, grants and funding
	Enthusiasm and activeness of tourism operators/local communities
	Internal state governments response system improvement
	Legal framework
Communication & Partnership	International & domestic partnership: the leading role of DITID regarding tourism resilience Queensland
	Rebranding and image recovery
	More live information for small tour operators

It can be seen that the current performances of Governance & Resources are above the average, which means the government is playing a significant role in natural disaster resilience with adequate leadership, sufficient policy supports and a decent commitment level. There are rooms for improvements in terms of Knowledge & Skills indicators as the public and communities should have better understandings of the causes and effects of natural disasters and engage in the disaster relief processes. With the scope of Restrictions & Incentives, the financial initiatives are adequate with minor flaws, while the real issue is the lack of local businesses' enthusiasm for recovery due to the relatively lower attention to SMEs. With the globalisation and the development of information technology, Communication & Partnership has become critical regarding tourism and events marketing. The matrix illustrates that this field still needs more efforts by enhancing domestic partnership, strengthening international collaboration and providing practical solutions of live information for small

businesses.

5. Recommendations: The Future of Industry Resilience

5.1 Establish Tourism-Focused Disaster Relief Command Group

While the government has developed several tourism recovery plans to support the regions that heavily rely on tourism, problems are still reported, including the complexity of applications, the waiting time for approvals, and less attention to small and remote businesses. Especially for the small business owners who may lack education and relative knowledge, the complicated application process could be a considerable challenge. The hold-ups of funding distribution could cause more tourism businesses and natural assets to be impacted. During the 2019–2020 Australian bushfire season, more than 700 bushfire-affected businesses applied for government funds, but only 147 were approved on time which also caused dissatisfaction from the community (Keating, 2020). Additionally, some small businesses that were not directly damaged by natural disasters but hugely impacted by the decrease in tourists' number and expenditure, were being ignored.

It is suggested that the tourism-focused disaster relief command group should be established. This group is responsible for providing official consultations for funding applications, especially for those who need particular application assistance. A clear explanation for these applicants could lead to a higher approval ratio and more efficient approval. Another vital role of the command group is to actively track the progress of funding and any updates of policies so more timely assistance for the affected tourism businesses could be delivered, and more businesses would survive.

5.2 Enhance Partnership

Tourism resilience is a systematic approach and needs to be considered in a broader community context. The concept of community resilience relates to stakeholders' collaborations and coordination within their social and economic functions. Many international Non-Governmental Organisations and commercial companies have provided services and products that can help small and medium tourism enterprises to recover from natural disasters' negative impact. The issues require the government to play a leadership role to integrating all the available resources to build bridges for those international/interstates NGOs, commercial companies and destination to improve community resilience.

For example, Tourism Tropical North Queensland and Tourism Queensland have launched marketing campaigns after Cyclone Larry, and commercial organisations like EarthCheck provided professional consulting services in terms of crisis management and mitigation strategies (Earthcheck, 2019). The key was to help tourism operators to access and optimise existing services to recover efficiently. It can be delivered as seminars or supportive workshops by inviting experts to share their insights and recovery instructions. Alternatively, build an online information platform for natural-disaster resilience might be helpful as well.

5.3 Publicity and MICE Leveraging

As discussed above, the destination's reputation could be seriously damaged by bushfires which is able to resulting in significant tourism loss. Due to adverse reports in the media, tourists may have negative attitudes toward the destinations by seeing the shocking pictures and videos. In the case studies, destination image rebuilding plays an essential role in post-disaster recovery. Therefore, the related government, organisations and institutions, as well as communities should consider establishing a series of marketing campaigns, aiming to rebuild positive images, correct negative impressions, or even create new destination images.

One of the methods is to restore visitors' confidence and operate business as usual (or open and ready for business) among post-disaster marketing campaigns, which will effectively restore the destination's attractiveness in tourists' minds. Another method is celebrity endorsements with evident effect to boost visitors' return to the destination, and shift the media's attention from the incidents to business events and recreational activity promotions by maintaining a high-profile to attract potential visitors. The government could host various types of meetings, incentives and conventions after disaster, which will benefit the region's leisure recovery.

5.4 More Attention to Small and Remote Communities

Due to insufficient supportive capacity and limited financial support, disasters also add catastrophic impacts on small and medium enterprises. Playing a critical role in innovation, employment and social inclusion, SMEs are vital to economic resilience. It has been realised that the function of disaster response on the SME level is more effective than the industrial prevention system. Therefore, in order to build the confidence of industry recovery, not only financial assistance but also mental support and social opportunities should be considered to encourage small and remote communities' recovery. Besides, appropriate insurance processes ensure that the related

insurance companies could share SMEs' recovery burden after a disaster. As long as the small businesses is able to getting sustainable guarantee of recovery continuously after disasters, the economy can bounce back to the development level before disasters as soon as possible.

6. Limitations

There are still critical challenges occupied with the planning and implementation of tourism resilience and recovery. Possible obstructions include the difficulties of funding approvals which need discussions among multiple government levels, and different benefits and opinions among stakeholders, as well as the various requirements for preparedness with the scope of various natural hazard types. Controversial and debatable aspects also exist with the consideration of strategy development. For instance, communication and language barrier issues are likely to occur during evacuation. The tourists who do not speak the local language sometimes are not able to fully understand the live instructions, which causes unnecessary losses for the businesses and potential harm to the tourists. The difficulties for tourism resilience are mostly about preventing bushfires regarding the lack of awareness and multiple fire spots at the early stages. Due to the huge cover of Eastern Australia's forest with limited residents, it could be hard to monitor fires. It is suggested that during the peak seasons of bushfire, the regional departments of hazard control could apply the technology with drones to make patrol inspections and inform the tour operators with the attention of potential danger. However, this application might be a violation of the nearby community's rights to privacy. More containment lines can help with bushfire relief, but the conduct is debatable as it may impair the forests and require parliament approvals to make the final decisions. Some destinations established museums and exhibition centres to showcase the past events of natural disasters and serve tourists and local communities about the disasters' impacts. The concern with this relates to ethical conduct—it might offense the residents who may never fully recover from the tragedies. Additionally, live disaster monitoring and information Apps can be designed to apply good intentions. However, it requires a level of trust, goodwill and proven effectiveness, as these interventions need both broad-scale community awareness and individuals' willingness to download the apps.

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