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Contingency Strategies to Foster Resilience in National Parks During Crisis Events such as COVID-19

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ABSTRACT

National Parks serve as sites of ecological conservation and a refuge for physical and mental well-being during times of crisis. However, COVID-19 caused several difficulties for national park managers, making it difficult for them to stay accessible. This study investigates the challenges that National Parks encounter during a crisis event such as COVID-19 and how to develop relevant contingency strategies for future disruptive events. Semi-structured interviews based on the resilience model of [Norris et al. (2008, Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology*, 41(1–2), 127–150)] were conducted with park managers at The Kruger National Park, South Africa, and the Peak District National Park, United Kingdom. Several stressors were identified regarding challenges faced in the parks due to the pandemic, such as uncertainty among staff and visitors and additional strain on resources such as time, funding, and available staff. This study underlines the importance of contingency planning in bolstering National Park resilience during global crises, offering practical insights for park management.

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National parks; contingency strategies; resilience; COVID-19; stressors; resilience model

1. Introduction

The COVID-19 pandemic has left an indelible mark on the tourism industry, prompting a global transition towards recovery, although caution is warranted given the vulnerabilities exposed (Duro et al., 2021; Fotiadis et al., 2021; Orîndaru et al., 2021; Priyadarsini et al., 2020). Concurrently, the pandemic has underscored the critical role of protected areas in fostering human well-being, biodiversity conservation, and ecosystem services (McNeely, 2021; Romagosa et al., 2015; Spenceley et al., 2021). A notable uptick in visitation to these areas post-COVID-19 reflects a heightened appreciation for outdoor spaces and nature amid pandemic-related constraints and uncertainties (Beery, 2020; Spenceley et al., 2021).

However, the surge in visitation has strained national parks, revealing challenges such as decreased enforcement levels, reduced funding, and detrimental impacts on

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management capabilities and local livelihoods (Hockings et al., 2020; Shrestha et al., 2023; Souza et al., 2021). This underscores the imperative of resilience for the long-term sustainability of protected area tourism. Developing contingency strategies, including educational initiatives promoting responsible visitor behaviour and consensus-building on environmentally sustainable practices, is vital to ensure resilience (Holling & Gunderson, 2001; Pich et al., 2002; Spenceley et al., 2021).

Contingency planning, preparing for and responding to potential risks, uncertainties, and disruptions is key to mitigating these challenges (Pich et al., 2002). Resilience is an emergent phenomenon that involves maintaining ongoing functions and controls despite disturbances (Holling & Gunderson, 2001). In the context of this study, resilience is framed as the tourism product resulting from well-defined contingency strategies to address specific challenges during adversity.

Efforts to enhance resilience entail reducing the dependency of protected areas on tourism and conducting comparative analyses of contingency strategies, as seen in the case of Kruger National Park and Peak District National Park (Andrianambinina et al., 2023; Hoffmann, 2022). Such research underscores the significance of developing contingency strategies in response to crises like the COVID-19 pandemic, facilitating crisis management and resilience in the tourism and conservation sectors (Litvin, 2020). Moreover, it highlights the necessity of interdisciplinary approaches in developing comprehensive and effective contingency plans. The interconnectedness of various sectors, as evidenced by the COVID-19 pandemic, emphasises the importance of collaboration and integration of insights from diverse disciplines such as public health, environmental science, and management (Raetze et al., 2022). By doing so, researchers can inform decision-making processes and contribute to the long-term resilience of protected areas amidst future crises.

The gap in knowledge surrounding resilience in national parks during times of crisis lies in the need for a comprehensive understanding of effective management strategies to maintain ecological integrity and sustainability amid unforeseen challenges. Existing research addresses the economic impact of tourism, visitor attitudes towards sustainable development, and natural disturbance management. However, it lacks in-depth exploration of specific strategies and mechanisms to enhance park resilience during crises. While studies highlight the importance of monitoring natural resources and conservation partnerships with local communities, research is needed to develop and evaluate tailored contingency strategies for crises. Additionally, although literature emphasises visitor patterns, economic benefits, community involvement, and the social capital of communities, there is a gap in understanding how these factors intersect with resilience-building efforts. Research on ecological integrity management and interdisciplinary collaboration among stakeholders is also insufficient in addressing how these efforts can enhance resilience during external shocks. This study aims to bridge these gaps by focusing on tailored contingency strategies, enhancing ecological integrity management, and fostering interdisciplinary collaboration, ultimately contributing to national parks' long-term sustainability and resilience.

2. Literature background

2.1. Building resilience in national parks

Resilience theory forms a robust theoretical framework for comprehending the intricate interplay among human society, economics, and the natural environment

(Walker et al., 2004). It underscores the importance of developing adaptation strategies to enable systems to respond to threats while preserving their essential characteristics. Within protected areas, resilience is often conceptualised through an ecosystem approach, endorsed by the Convention on Biological Diversity in 2000, which considers the cumulative impacts of various sectors (Bec et al., 2016; Lew, 2014). Strickland-Munro et al. (2010) applied resilience concepts to scrutinise the impact of tourism on local communities and nature destinations, especially in light of climate change. Moreover, community-based tourism has been identified as a potential contributor to the resilience of national parks, with local leadership and robust social networks playing crucial roles (Ruiz-Ballesteros & del Campo Tejedor, 2020). In addition, strategies to ensure National Parks stay resilient in times of crisis include safeguarding visitor and community health, promoting diverse income streams, equity, and inclusiveness (Spenceley et al., 2021). Long-term resilience for National parks would also entail strengthening the local economy, ensuring financial viability, and contemplating long-term investments (Maziar et al., 2022). Social-ecological perspectives inform management strategies to enhance protected public areas such as National Parks resilience (Tanaka & Takashina, 2023). Research guided by this framework contributes to adaptive management approaches vital for future challenges (Kupfer et al., 2021).

National Parks' resilience necessitates interdisciplinary perspectives, considering scale-related issues and interconnected dynamics (Birgé et al., 2016). Cross-scale influences and system interactions inform management decisions (De Vos et al., 2017). Power relations and governance dynamics shape National Park resilience, necessitating context-specific approaches e.g. a national park in Africa would have a different approach than a National Park in Europe (Franco-Gaviria et al., 2022). Management strategies must integrate ecological and social dynamics, understand cross-scale interactions, and challenge embedded approaches for future conservation efforts (Glaser & Glaeser, 2014). Furthermore, leadership, entrepreneurs' motivations, and self-organisation are pivotal for fortifying resilience in tourism systems (Espiner & Becken, 2014). In addition, Cochrane (2010) delineated critical elements for a resilient tourism system, stressing responsiveness to market forces, stakeholder cooperation, and strong leadership. In protected areas, tourism's contribution to conservation is indispensable. Nevertheless, understanding and responding to market forces is imperative for sustainable tourism (Cochrane, 2010). Profitable businesses are fundamental for tourism viability, necessitating a balanced approach. However, concerns arise when stakeholders disregard potential impacts such as climate change and potential future pandemics.

Resilience thinking integrates diverse dimensions, encompassing biophysical and social aspects, and acknowledges uncertainty and evolving knowledge (Davidson et al., 2016). Zhang et al. (2024) applied the "Destination Sustainability Framework" rooted in resilience concepts, indicating the potential to reduce tourism vulnerabilities while fostering disaster recovery and resilience. National parks in the United States have implemented various strategies to enhance resilience, ensuring the well-being of visitors and the ecosystems they protect. Yellowstone National Park stands out for its proactive approach to keeping the park accessible to the public during the pandemic, promoting outdoor activities as safe options for recreation and encouraging visitors to engage in physical activities in open spaces while adhering to social distancing

guidelines (Geng et al., 2021). Similarly, Yosemite National Park has demonstrated adaptive management strategies to monitor and manage visitor patterns effectively, meticulously tracking park visitation data and implementing measures to control overcrowding, ensuring a safe and enjoyable experience for visitors while mitigating the risk of virus transmission (Kupfer et al., 2021). Grand Canyon National Park has prioritised community engagement and communication, fostering open collaboration with local communities and effectively communicating health and safety guidelines, park regulations, and updates on park operations (Tambo et al., 2021). Acadia National Park has embraced innovative technology, leveraging mobile device data and location-based services to track visitor behaviour and assess the impact of the pandemic on park visitation, allowing for data-driven insights to enhance the overall park experience. Additionally, Zion National Park has prioritised promoting equitable access to park resources, supporting social inclusion and community well-being by ensuring all individuals have access to outdoor spaces and recreational opportunities (Kupfer et al., 2021). Furthermore, Glacier National Park has exemplified collaboration with public health authorities, aligning park operations with public health guidelines and implementing sanitation measures, capacity limits, and mask mandates to protect visitors and staff from COVID-19 transmission.

Most national parks applied a strategy to build resilience during the pandemic by implementing enhanced health and safety protocols, including strict hygiene measures and mandatory mask usage (Kontogiannis, 2021). Furthermore, visitor management and capacity control measures such as pre-booking systems and limited capacities were implemented to facilitate physical distancing (Beery, 2020). Some parks also utilise communication channels such as Facebook and Instagram to provide visitors with up-to-date information on safety guidelines and closures (Miller-Rushing et al., 2021). Advanced technologies such as remote cameras and sensors were used to monitor wildlife populations and detect illegal activities during reduced staff presence (Miller-Rushing et al., 2021). These measures aimed to ensure staff and visitor safety while maintaining the sustainability of parks and game reserves (Miller-Rushing et al., 2021). National parks are involved in various strategies for recovering and building resilience efforts. They diversify visitor experiences through technology-based interpretive programs and immersive activities and collaborate with local communities, government agencies, and tourism stakeholders to foster shared decision-making and collective responsibility (Wendt et al., 2021). Adaptive management and continuous monitoring, which include tracking visitor trends and ecological indicators that enable informed decision-making (Geng et al., 2021), are also being implemented. These strategies aim to rebuild visitor confidence and ensure the long-term sustainability of national parks. Contingency planning is essential for effectively managing resources, protecting wildlife and habitats, and ensuring visitor and staff safety during emergencies or disruptive events in national parks (Geng et al., 2021).

In conclusion, tourism systems in protected areas must be responsive to market forces, promote stakeholder cooperation, exhibit strong leadership, benefit local communities, and support environmental conservation to adapt to threats posed by global environmental change and market conditions. These features enhance resilience, ensuring long-term sustainability.

2.2. Challenges faced by national parks during COVID-19

Visitor mobility patterns changed due to the pandemic (Ritchie, 2020), which had diverse impacts on protected public areas, ranging from general challenges such as crowding and environmental degradation due to increased visitation to social impacts like conflicts with gateway communities and strained relationships with visitors (Dangi & Gribb, 2021; McGinlay et al., 2020). National parks experienced an upsurge in visitor numbers during the pandemic as they were usually exempt from restrictions (Geng et al., 2021), with visitors travelling closer to home due to uncertainty with the development of the pandemic. Such increases in tourist traffic can place significant ecological stress on national parks, often exceeding carrying capacity and causing environmental degradation, such as soil erosion, habitat destruction, and pollution (Rogowski, 2020). This strain on natural resources and infrastructure underscores the need for sustainable management practices, such as monitoring and tracking visitor patterns and adjusting strategies to specific situations such as COVID-19 accordingly (Religa & Adach, 2020; Rogowski, 2020). Additionally, the growth in visitor numbers also led to misunderstandings with locals (Scholtz & Saayman, 2018) and challenges such as noise, littering and irresponsible behaviour (Jones & McGinlay, 2020).

While tourism can generate economic benefits and uplift local economies, failure to address ecological costs can lead to negative consequences, as shown in the case of the Bavarian Forest National Park (Mayer, 2014). Building resilience offers new potential for National Parks as it involves engaging stakeholders and developing strategies that balance ecological, socio-cultural, and economic goals (García-Melón et al., 2010; Guo & Chung, 2016). Additionally, educating tourists on responsible behaviour can help mitigate their environmental impact (Stanic-Jovanovic & Cvetković, 2016).

Situational impacts include disruptions in access, affecting local economies and visitation patterns. At the same time, behavioural adaptations have led to changes in recreation patterns and potential long-term effects on diversity and equity in outdoor recreation (Winter et al., 2020). The COVID-19 pandemic laid bare the vulnerabilities of national parks across multiple fronts. Templeton et al. (2021) highlighted a stark decline in tourist arrivals, revealing the susceptibility of parks to external shocks and their struggle to adapt swiftly. Shehzad et al. (2021) elucidated the global economic fallout, which strained national parks financially, emphasising their vulnerability to broader economic crises. Alonso et al. (2020) noted significant management challenges, necessitating better preparedness and adaptability to manage evolving visitation patterns and ensure visitor safety. Souza et al. (2021) pointed out health disparities that exacerbated concerns about unequal access to parks during crises, thus unveiling a lack of resilience in ensuring equitable access. Declining public interest also surfaced, indicating challenges in maintaining engagement and relevance during crises (Toubes et al., 2021).

These findings underscore the urgent need for comprehensive strategies to bolster the resilience of national parks. Smith et al. (2021) stressed the necessity for further research to comprehend the long-term effects of the pandemic on conservation efforts as well as the economic implications thereof. Ferreira et al. (2020) emphasised the need to understand gaps in knowledge to develop effective mitigation strategies. Andrianambinina et al. (2023) called for greater insight into the impacts of reduced tourism and alternative

funding mechanisms. Hockings et al. (2020) highlighted the importance of studying protected area management's social and economic dimensions during crises.

Contingency planning, crucial for anticipating, responding to, and recovering from adverse events, is closely tied to resilience (McEntire, 2021). Giousmpasoglou et al. (2021) underscored the significance of contingency planning in ensuring the ability of protected areas to withstand and recover from crises like COVID-19 while maintaining essential functions and long-term sustainability.

2.3. Conceptual framework

Norris et al. (2008) underscore the significance of resilience, advocating for a process-oriented approach that emphasises adaptation to stress and change, particularly through flexibility (Saja et al., 2019). Their model of resilience serves as a framework for understanding how national park managers perceive strategies to address COVID-19 impacts, highlighting the importance of building strong communities and enhancing adaptive capacities (Onstad et al., 2012).

When faced with crises like COVID-19, organisations such as national parks typically react in one of two ways: resistance or exposure to stressors. Research conducted by Jeon and Yang (2021) and Raassens et al. (2022) supports the notion that resistance to change is unlikely during crises, emphasising the need for effective crisis management (Jones & Comfort, 2020). Instead, parks are exposed to specific stressors such as economic, visitor, and environmental impacts, prompting them to mobilise resources to address these challenges. Florido-Benítez (2021) confirms the significant impact of crisis events on tourism and the need for strategic planning and recovery efforts.

Resource mobilisation, a medium to long-term process, may temporarily disrupt park operations but enables adaptation through contingency strategies (Browder et al., 2023). Effective resource utilisation has been crucial for the pandemic response of the tourism industry, which requires robust and rapid actions to facilitate recovery (Norris et al., 2008).

Transient dysfunction during the pandemic highlighted vulnerabilities within the tourism industry, influenced by demographic and socioeconomic factors, which necessitate resilience-building efforts (Jones & Comfort, 2020; statssa.gov.za, 2019). Resilience is a dynamic process that ensures the continuation of essential functions and regulatory mechanisms in the face of disruptions (Holling & Gunderson, 2001). This study conceptualises resilience as the outcome of strategically planned contingency measures designed to tackle specific challenges during adversity. This model serves as a foundational framework for disaster studies (Jahn & Johansson, 2018; Onstad et al., 2012; Singh et al., 2022; Soriano, 2019; Wickes et al., 2015), stressing the importance of understanding stressors and adaptive capacities, and interventions to enhance wellness over time (Onstad et al., 2012; Wickes et al., 2015) (Figure 1).

2.4. Case study areas: the Kruger and Peak District National Parks

As COVID-19 was the focal point of our study, it was crucial to approach this from a comprehensive perspective to determine how national parks fully developed their resilience. Therefore, we chose two iconic and globally and nationally esteemed national parks as our case study areas: Kruger National Park (KNP), South Africa and Peak District National

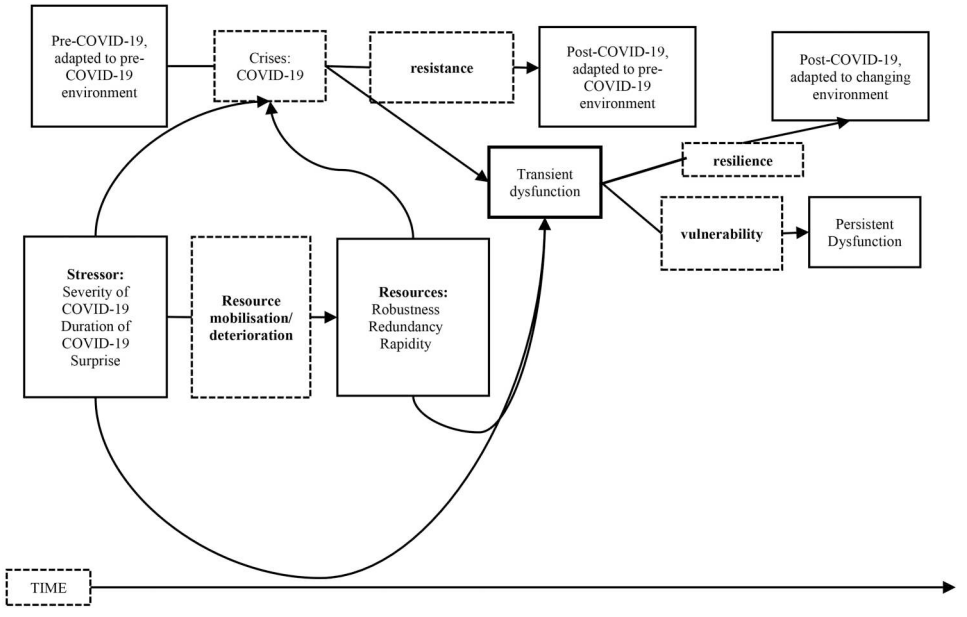

Figure 1. Adapted model of resilience for COVID-19 (Norris et al., 2008).

Park (PDNP), UK. Both were the first national parks in their respective countries, with KNP established in 1926 through the merger of the Singwitsi and Sabi Games Reserves and PDNP set up in 1951. The PNDP annually attracts over 12 million visitors (Shaker & Hermans, 2021), whilst the KNP welcomes close to 1 million (South African National Parks, 2024). The geographical areas spanning both parks are encompassing based on the size of the country. KNP covers an area of 7,523 sq. mi in the provinces of Limpopo and Mpumalanga in north-eastern South Africa, whilst the PDNP spans 555 sq. mi. in the regions of East Midlands, West Midlands, North West, Yorkshire and Humber.

Whilst these parks do vary in climate, ecosystems, socioeconomic settings, funding sources and organisational structure (Wilgen, 2018) and had different experiences in how the pandemic was managed, their shared commonalities detailed above and cohesive ethos around the conservation of wildlife and natural beauty, cultural heritage, and visitor education (PDNP, 2023; South African National Parks, 2024) makes them key sites in helping to understand how resilience is framed in national parks. The importance of selecting these parks is to determine how they experienced the pandemic and establish if different parks encounter the same challenges caused by COVID-19. Furthermore, the similarities and diversity of the KNP and PDNP could provide a more nuanced understanding of COVID-19 preparedness, helping to shape the development of national park strategies.

3. Method

3.1. Research method

This study is embedded in interpretivism as the research sought to understand the experiences, perceptions, and strategies related to COVID-19 preparedness in the selected

national parks (Tong et al., 2012). Data were collected via semi-structured interviews, which explored participants' experiences with the impacts of the pandemic and strategies employed to deal with them. This method allowed for probes and emphasis on specific points, insights, reflections, and meaning, promoting dialogue and knowledge exchange between the interviewer and interviewee (Salehzadeh Niksirat et al., 2023). Non-probability purposive sampling, also known as judgment sampling, was employed in this study (Tong et al., 2012). This sampling approach involves the researcher using their expertise to select a suitable sample for the research (Tong et al., 2012). The sample comprised ten managers from KNP in SA and PDNP in the UK. The selection of managers from both parks with different organisational systems, land ownership, climate, visitor motivation, and activities being offered aimed to gather comprehensive data on contingency strategies and offer insights into different types of national parks worldwide (Tong et al., 2012). The sample size was considered sufficient, as this was informed by data saturation, in which participants' responses became repetitive, and no new themes or information emerged from the interview transcripts. This indicates that the researcher gathered sufficient data to comprehensively understand the phenomenon under study (Fusch & Ness, 2015). Trang et al. (2023) assert that the data credibility should be weighed through the theoretical saturation and not the number of interviewees. Creswell (1998) suggests a range of five to 25 participants in interpretivism research. Additionally, the specific context and requirements of the study were taken into consideration when selecting the participants, for example, selecting managers who had experienced COVID-19-related impacts and had a long history of working with people and natural resources, making them valuable participants in the study (Guest et al., 2020) (Table 1).

3.2. Data analysis

Data analysis involved identifying, analysing, and reporting themes in the data (Nowell et al., 2017) and was supported by the qualitative analysis software (Atlas. ti). The thematic analysis process began with data familiarisation, where the researcher thoroughly read the transcripts to grasp both the content and context. This step was crucial in laying the groundwork for the subsequent analysis. Next, the initial codes were generated by identifying relevant data segments and labelling them with descriptive or interpretative codes, which capture the essence of the data points. These codes were then grouped into broader themes that reflect patterns within the data. The researcher then reviewed and refined the themes, ensuring they accurately represent the underlying meanings and

Table 1. Respondents' details.

Respondent number	Gender	Park Location
R1	Male	South Africa
R2	Female	South Africa
R3	Male	South Africa
R4	Male	South Africa
R5	Male	South Africa
R6	Female	South Africa
R7	Female	United Kingdom
R8	Male	United Kingdom
R9	Female	United Kingdom
R10	Male	United Kingdom

are coherent in relation to the entire dataset. After this, each theme is defined and named, articulating its significance to the overall narrative of the research.

Once the thematic analysis was complete, the researcher integrated the identified themes into a cohesive report supported by illustrative quotes from the data. This analysis was particularly valuable in formulating contingency strategies for future crisis events, such as the COVID-19 pandemic, by offering actionable recommendations based on the patterns and themes identified (Nowell et al., 2017).

4. Results and discussion

The results led to the development of a model, as illustrated in Figure 2, an adapted version of the resilience model to apply to a crisis event such as COVID-19, discussed in the following section.

4.1. Stressors caused by COVID-19

Managers rely on various coping mechanisms to reduce the impacts of stressors. Coping responses can be proactive (psychological preparedness) before an event occurs (Aspinwall, 2011) or adaptive, aimed at defusing future impacts. It is a temporary solution for day-to-day stressors (Gallopín, 2006). Several coping responses identified by managers used to address the COVID-19-related effects in the parks have been construed by Norris et al. (2008). The data indicate several stressors resulting from the COVID-19 pandemic in the two case study areas, as illustrated in Figure 2.

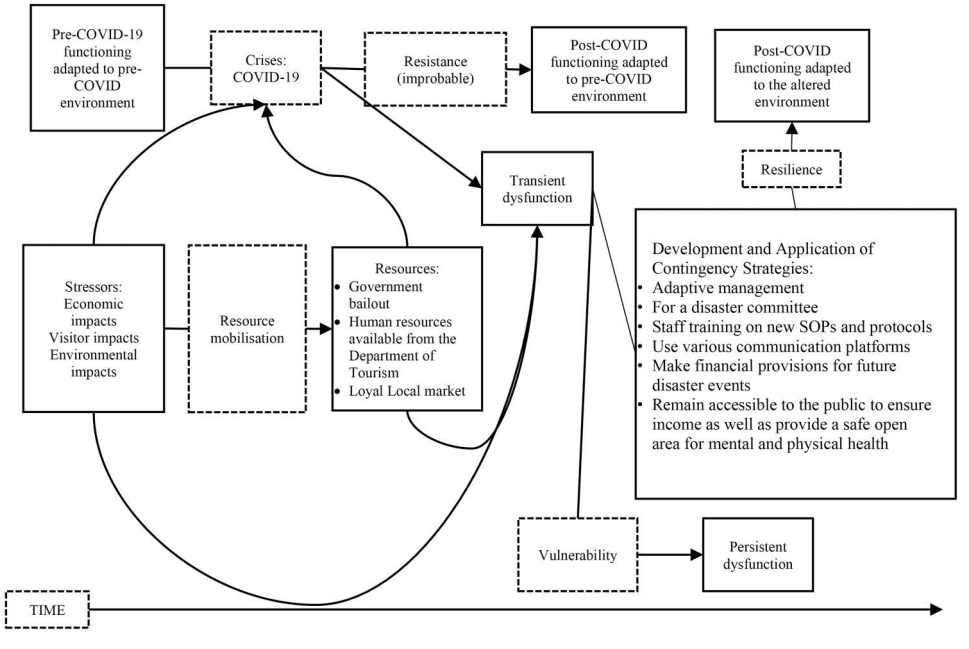

Figure 2. A COVID-19 resilience model as applied to national parks' contingency strategies this aligns with the concept of psychosocial consequences in the aftermath of disasters, as Norris et al. (2008) described.

One prevalent theme identified was the stressor of uncertainty and fear in individuals.

> Well, right in the beginning, the major impact was uncertainty. R1

A common theme from several participants was communication challenges, such as the issue of ambiguous information from the government.

> … one of the biggest challenges was understanding how we applied this sort of government guidance and the kind of legislation and shared that with the public. R8

Furthermore, non-compliance of visitors proved to be a challenge for park management.

> … people were not wearing their masks. When people sit in the park, they think, that is it, they are in the park, they are safe. R5

Another significant stressor identified was the decrease in visitor numbers, leading to a loss in revenue and highlighting the fragility and risk of relying on a single primary income stream.

> … we used to make money through a conservation fee from the international tourists. However, now that the majority of them are not coming. R4

Managers of both parks faced challenges in accommodating visitors with limited staff and budgets whilst cleaning and sanitising practices intensified.

> a lot of additional cleaning, additional sanitising of things, additional kind of all of things that everyone had to do. R9

Increased cleaning efforts, safety measures, and social distancing requirements have strained park management systems (Qiu et al., 2020). These stressors (uncertainty, unclear communication from government, loss of revenue, and limited human resources) contribute to vulnerability and align with the COVID-19 Resilience Model proposed by Norris et al. (2008) (Goodell, 2020). The research identifies case-specific stressors and offers insights into adaptation strategies (Herrero & Kraemer, 2022; Jeon & Yang, 2021; McGinlay et al., 2020). The literature supports that the pandemic introduced novel challenges for park management, necessitating innovative staff and visitor well-being approaches while maintaining operations (Herrero & Kraemer, 2022; Qiu et al., 2020; Smith et al., 2021). The COVID-19 Resilience Model of Norris et al. (2008) serves as a valuable framework for comprehending vulnerability and the importance of adaptive strategies (Goodell, 2020). Recognising and addressing these stressors enables park management to develop mitigation strategies and enhance resilience for future crises (McGinlay et al., 2020).

4.2. Resource mobilisation

Park managers responded to some of the abovementioned stressors by mobilising available resources to combat their impacts. Resource mobilisation refers to sourcing to replenish vulnerable areas, such as reserving money for unforeseen events or offering post-disaster psychosocial interventions. One challenge for both parks was obtaining approval for relief funds, thereby prolonging recovery, especially concerning infrastructure upkeep.

> … luckily we were given a bailout by the government. R5

Notably, visitation increased considerably post-lockdown. Participants highlighted several instances where the number of visitors post-COVID-19 overtook pre-pandemic levels, which held the promise of increased revenue.

> Increasingly when we've seen, one thing we've seen is the influence of social media on where people visit, people going to locations have not visited as much before because they've appeared on social media or been liked or shared and so that suddenly sort of increased liked dramatically increased visitor numbers … . R9

> We reckon about 25% of visitors during COVID-19 have never been to the national Park before. So we reckon we have had between 25% and 33% uplifting numbers. R10

This finding could point to the importance of social marketing as a strategy to attract more visitors, leading to more revenue and possibly more volunteers (Gumilang et al., 2021).

Another resource mobilised was strengthening relationships with various stakeholders such as law enforcement, the local community (volunteers), the government and landowners.

> So, our response was basically to change the approach to the things we need to do, to work closely with the police in the initial stages of lockdown, to slowly bring back our volunteers in a controlled based on the risk assessment and to slowly build up our engagement approach over a period of time. R7

> Developing that partnership with all the landowners and other people … The tourism board works really closely with us. They promote the National Park as a place to come and visit. And they were much more careful in the messages they sent out and kind of like, prepare before you come. R10

> And then, luckily, one of the things that is good that we got is from the Department of Tourism, whereby we got additional manpower at the camps. R4

> So, for example, the national trust owns/has quite a lot of large land ownership within the national park. R9

Park managers responding to various stressors have actively mobilised resources, employing strategies such as seeking relief funds and fostering relationships with stakeholders (Henseler et al., 2022). However, obtaining approval for relief funds has posed hurdles, particularly in infrastructure maintenance (Henseler et al., 2022). Post-lockdown, national parks have witnessed a notable surge in visitation, including a substantial influx of new visitors, suggesting the potential for increased revenue and volunteer engagement (Kim et al., 2023). Recognising the impact of social media on visitor behaviour, park managers are considering social marketing as a viable strategy to attract more visitors, ultimately contributing to increased revenue and volunteer participation (Lingua et al., 2022). This underscores the evolving role of communication and marketing strategies in contemporary park management. Additionally, efforts have been directed towards fortifying partnerships with law enforcement, local communities, government agencies, and landowners. These collaborative endeavours aim to mobilise additional staffing and resources, reflecting the importance of resource mobilisation and collective partnerships in effectively addressing the multifaceted challenges faced by national parks (Kupfer et al., 2021).

4.3. Resilience stage

The first finding that suggested that the parks have reached a resilience stage was forming a disaster committee.

> Within four days or three days, we had our very own Compliance Committee whereby we spoke to the staff that was left in the camp about 10 or 12 that we were left behind, so we like getting any information that we are hearing from TV and information that was coming from the Disaster Committee. We were communicating and implementing it to ensure that people here are safe, so should anything happen, similar procedures will take place. R2

A "disaster" or "COVID committee" could help organise and disseminate critical information and plan to provide staff with the necessary PPE (personal protective equipment) (sanitiser, masks, etc.) during a pandemic such as COVID-19 and similar disaster events. A disaster committee proved to be a valuable resource for taking responsibility for identifying accurate and relevant information. According to Norris et al. (2008), the ideal response to a crisis is resistance in the form of resource mobilisation for absorbing the stressor.

The second prominent finding relevant to resilience was establishing SOPs and protocols.

> But being a state-owned entity, it is very important for us to abide by those rules. And a lot of people did not understand the rationale for certain things. But as we went through that, we wrote SOPs and protocols, et cetera, for managing this situation. R1

District managers emphasised the importance of establishing SOPs (Standard Operation Procedures) and protocols and training staff to implement these protocols. The training enabled staff to be prepared and provided additional information relevant to the COVID-19 pandemic.

The third finding indicating a movement towards resilience is the effective dissemination of information through training and efficient communication methods.

> We have got the training department. So, the training department is the one who got the information together, and they went around the Park to train the staff. R3

Increased anxiety regarding health and job security impacted employee morale and complicated operational challenges. Park management needs to assure their staff of the steps to decrease the uncertainty, panic, and the spread of misinformation. Norris et al. (2008) supported this strategy and established the importance of effective instruction when communicating risk. According to Norris et al. (2008), resilience depends on the ability of a system to respond to changes rather than being stable. Resilience is dynamic and multi-directional, interacting across temporal and spatial scales (Desouza & Flanery, 2013).

4.4. Adaptation stage

Adaptation is the process of reducing the vulnerability of the parks to COVID-19-related impacts with minimum impairment. This stage is termed "population wellness" (Norris et al., 2008). Patterson and Mccubbin (1983) and Norris et al. (2008) construed three key adaptation themes: adaptive capacity, transient dysfunction, and post-event level of functioning. The following contingency strategies were implemented to foster resilience and to ultimately function and adapt to a post-COVID environment:

In preparing for emergencies, respondents from both parks emphasised the importance of monitoring and providing accurate and timely information about an event or situation to those in need.

> So it was, you know, it impacted operations tremendously, especially if you think in normal circumstances and now all of a sudden and also, I think the miscommunication in the Gazette sometimes, you know, to such an extent that, that we requested our minister to, to get clarification. R1

Interagency networks were mentioned in many of the narratives from both parks as a form of social capital.

> Developing that partnership with all the landowners and others. Marketing Peak District and Derbyshire, which are our tourism destinations. We are not the tourist board as such. We work. It is a separate board that does that work. And they work closely with us … R10

Respondents emphasised the willingness of other agencies to support the parks before and during a crisis. For example, findings showed how the KNP partnered with the Department of Tourism and assisted with providing human resources to replenish staff unable to work due to illness or quarantining. During emergencies, participants mentioned how their relationship with other agencies, such as local police or mobile clinics, ensured visitor safety. This service benefited employees who were managing uncooperative visitors or those who needed the means to travel to hospitals in neighbouring towns.

> We have got the mobile clinic, which will come here once a week. So, all the staff, when they need something, they can go there and chat and stuff like that. But just like the park, it is not easy at Skukuza, our biggest camp. We have a doctor's station there, and they say a clinic, seven days a week. So, what I mean is if you have got someone who you think maybe he has got COVID or whatever, that person can walk to the clinic, it doesn't, it does not involve another person having to drive and exposing more. R3

Palliative care and hospice services are crucial in responding rapidly and flexibly to the pandemic, ensuring that protocols for symptom management are available, and training non-specialists in their use (Etkind et al., 2020). Adapting systems and policies: National Park managers must be flexible and rapidly change systems and policies in response to the pandemic. This may involve limiting visitor hours and numbers and stopping volunteer services (Etkind et al., 2020).

Protecting staff member's mental health: Addressing the mental health risks faced by staff members during the COVID-19 emergency is essential. This includes providing sufficient staff training and resources, implementing training and treatment protocols, and offering psychological support services based on coping strategies for managing stress (Chirico et al., 2020).

> The first thing that we did was training; you had to train all staff members on COVID-19. And we also had to give them the PPEs to wear when they go to do the cleaning. R6

Observing and monitoring COVID-19-related behaviours of visitors in national parks is essential.

> So we do try to remind people to kind of follow some protocols, at least keep their distance, wash their hands. They've still got hand-sanitised wrap. We do have to tell people to wear masks if they're in enclosed spaces, and we still have protocols around cars and things as well. R10

This includes assessing compliance with guidelines, minimising group size, wearing masks, and maintaining social distancing (Coroiu et al., 2020).

Effective resource utilisation or external support can alleviate stress and facilitate adaptation to changes (Kuntz, 2021), whether biological or physical, and the resources exhibit robustness, redundancy, and rapidity dimensions (Norris et al., 2008). These challenges led to transient dysfunction, a common phase in most crises, exposing vulnerabilities in National Parks (Lo & Hsieh, 2020). Most of the system adapts to stress during this period, with only a few critical components impaired before returning to pre-event functioning (Norris et al., 2008). However, many COVID-19-related impacts do not result in complete recovery, potentially leading to long-lasting changes in system dynamics over months or years.

5. Conclusion and implications

The adapted COVID-19 Resilience Model makes a theoretical contribution by aligning stressors and vulnerability factors with the model of Norris et al. (2008), offering a framework for understanding and addressing challenges in the form of contingency strategies in national park management during COVID-19. This study further contributed due to its unique approach of focusing on two renowned national parks. Few studies have adopted this comparative approach to understanding the impacts of COVID-19 on national parks (Bocharnikov et al., 2020). The results indicated considerable overlap in challenges faced by both parks. They could indicate that the recommended contingency strategies could be applied to other parks in the future if similar crisis events occur. However, some challenges were context-specific and needed tailored responses for the specific park. In both national parks, a heavy reliance on tourism resulted in financial strain, emphasising the need for robust financial strategies.

Resource mobilisation emerged as a critical practical strategy to address financial stressors. The COVID-19 pandemic exposed the financial vulnerabilities of national parks, as reduced visitor numbers led to significant revenue losses despite a rise in local visitation in some areas (Geng et al., 2023; Kupfer et al., 2021). This financial shortfall pushed park managers to explore alternative funding options, such as grants, partnerships, and community support, highlighting the need for diversified revenue sources beyond tourism (Miller-Rushing et al., 2021). Engaging local communities has been crucial for ensuring equitable access and support (Alba et al., 2022). Additionally, parks have adapted their operations by enhancing efficiency and implementing flexible management strategies to cope with changing visitor patterns and health guidelines during the pandemic (Miller-Rushing et al., 2021).

The study also contributes to the theoretical discourse on resilience's dynamic and multi-directional nature (Desouza & Flanery, 2013). By acknowledging both the transient dysfunction caused by COVID-19 and the potential for long-lasting changes in national park dynamics, the research provides insights into the complex interplay between short-term adaptations and long-term resilience building.

One crucial aspect of crisis management in national parks is the establishment of robust organisational structures. The research highlights specific strategies, such as forming disaster committees responsible for obtaining and disseminating important information and establishing SOPs as practical contributions to enhancing park resilience.

This approach aligns with the work of Christianson and Barton (2021), who emphasised the importance of organisational sensemaking during crises. Furthermore, communication emerged as a critical factor in managing the pandemic's impact on national parks. The study notes that both parks encountered communication challenges, highlighting the need for improved strategies, especially when faced with ambiguous government information. This finding underscores the importance of clear and transparent communication in ensuring visitor compliance and effective park management during crises. The emphasis on communication strategies resonates with the work of Norris et al. (2008), who identified information and communication as key elements of community resilience.

In addition, issues around the mental health and well-being of park staff also emerged as a significant concern. The research indicates that "uncertainty and the mental health of staff should be addressed", suggesting that "coping mechanisms could involve proactively implementing psychological preparedness to mitigate stressor impacts". This focus on psychological support aligns with the findings of Kuntz (2021), who highlighted the importance of coping strategies in managing stress and adapting to challenging situations. Finally, monitoring systems played a crucial role in managing the pandemic's impact on national parks. The study emphasises that monitoring challenges underscore the practical application of robust monitoring systems to address disease spread, safety measures, and public compliance, which ultimately leads to maintaining ecological resilience (Birgé et al., 2016).

In conclusion, the study's findings offer practical insights for national park managers to navigate the complexities of crises like COVID-19. By embracing adaptive measures, strengthening resource mobilisation, and addressing vulnerability factors, national parks can enhance their resilience and effectively manage the challenges posed by external events. The theoretical contributions of the study align with established resilience models, providing a comprehensive framework for understanding and responding to stressors in national park management.

5.1. Limitations and future research

While we have taken great care to ensure the thoroughness of our findings, we also recognise several limitations to our study. The small sample size, the specific case study contexts, and the view of one stakeholder group (managers) limited the data. Even though the chosen parks were very different in how they were governed and managed, the challenges and stressors faced were similar. We do not claim generalisability with our results. Still, given the similarities between the national parks, there might be transferability to other park contexts to understand how they have coped and developed resilience. Hence, examining the consistency of these results within a larger sample would be valuable. This could be done by comparing national parks in a single country or focusing on several countries.

This research focused on understanding the managerial perspective because they were crucial in overseeing the national parks during the pandemic and had developed knowledge about the stressors and how resources were managed during this period. As such, we did not consider visitors to national parks. This can be viewed as a limitation of the study. Further research can build on the scale of the interviews for a broader stakeholder

perspective to include visitors to compare the stressors' results and account for any bias in the study by focusing on other stakeholder groups.

Future research can focus on refining the adapted resilience model and its applicability in different crisis contexts. Exploring the long-term impacts of reduced funding and maintenance on national parks and alternative funding mechanisms during crises would enhance the understanding of park resilience. Such studies could also investigate the role of technology in improving visitor experiences and safety during crises. Moreover, the overwhelming advantages of accessible national parks during crisis events indicate the need for more research to emphasise the argument to authorities of the importance of keeping these areas of refuge open to the public.

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References

Alba, C., Pan, B., Yin, J., Rice, W. L., Mitra, P., Lin, M. S., & Liang, Y. (2022). COVID-19's impact on visitation behavior to US national parks from communities of color: Evidence from mobile phone data. *Scientific Reports*, *12*(1), 13398. https://doi.org/10.1038/s41598-022-16330-z

Alonso, A. D., Kok, S. K., Bressan, A., O'Shea, M., Sakellarios, N., Koresis, A., Solis, M. S., & Santoni, L. J. (2020). COVID-19, aftermath, impacts, and hospitality firms: An international perspective. *International Journal of Hospitality Management*, *91*, 102654.

Andrianambinina, F. O. D., Schuurman, D., Rakotoarijaona, M. A., Razanajovy, C. N., Ramparany, H. M., Rafanoharana, S. C., Rasamuel, H. A., Faragher, K. D., Waeber, P. O., & Wilmé, L. (2023). Boost the resilience of protected areas to shocks by reducing their dependency on tourism. *PloS ONE*, *18*(4), e0278591. https://doi.org/10.1371/journal.pone.0278591

Aspinwall, L. G. (2011). Future-oriented thinking, proactive coping, and the management of potential threats to health and well-being. In T. A. Revenson, A. R. D'Augelli, S. E. French, D. Hughes, L. E. Sweeney, G. E. Pransky, & E. DiClemente (Eds.), *The Oxford handbook of stress, health, and coping* (pp. 334–365). Oxford University Press.

Bec, A., McLennan, C. L., & Moyle, B. D. (2016). Community resilience to long-term tourism decline and rejuvenation: A literature review and conceptual model. *Current Issues in Tourism*, *19*(5), 431–457. https://doi.org/10.1080/13683500.2015.1083538

Beery, T. (2020). What we can learn from environmental and outdoor education during COVID-19: A lesson in participatory risk management. *Sustainability*, *12*(21), 9096. https://doi.org/10.3390/su12219096

Birgé, H. E., Allen, C. R., Garmestani, A. S., & Pope, K. L. (2016). Adaptive management for ecosystem services. *Journal of Environmental Management*, *183*, 343–352. https://doi.org/10.1016/j.jenvman.2016.07.054

Bocharnikov, V., Dong, S., Zhao, M., & Li, Z. (2020). Reconstruction of a system of national parks and protected areas in China and Russia according to new demands and challenges facing the implementation of the Belt and Road project. *Geography Environment Sustainability*, *13*(3), 76–83. https://doi.org/10.24057/2071-9388-2018-56

Browder, R. E., Seyb, S., Forgues, A., & Aldrich, H. E. (2023). Pandemic makers: How citizen groups mobilised resources to meet local needs in a global health crisis. *Entrepreneurship Theory and Practice*, *47*(3), 964–997. https://doi.org/10.1177/10422587221120206

Chirico, F., Nucera, G., & Magnavita, N. (2020). COVID-19: Protecting healthcare workers is a priority. *Infection Control & Hospital Epidemiology*, *41*(9), 1117–1117. https://doi.org/10.1017/ice.2020.148

Christianson, M. K., & Barton, M. A. (2021). Sensemaking in the time of COVID-19. *Journal of Management Studies*, *58*(2), 572. https://doi.org/10.1111/joms.12658

Cochrane, J. (2010). The sphere of tourism resilience. *Tourism Recreation Research*, *35*(2), 173–185. https://doi.org/10.1080/02508281.2010.11081632

Coroiu, A., Moran, C., Campbell, T., & Geller, A. C. (2020). Barriers and facilitators of adherence to social distancing recommendations during COVID-19 among a large international sample of adults. *PLoS ONE*, *15*(10), e0239795. https://doi.org/10.1371/journal.pone.0239795

Creswell, J. W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Sage.

Dangi, T. B., & Gribb, W. J. (2021). Sustainable ecotourism management and visitor experiences: Managing conflicting perspectives in Rocky Mountain National Park, USA. In D. Diamantis (Ed.), *Stakeholders management and ecotourism* (pp. 136–156). Routledge.

Davidson, J. L., Jacobson, C., Lyth, A., Dedekorkut-Howes, A., Baldwin, C. L., Ellison, J. C., Holbrook, N. J., Howes, M. J., Serrao-Neumann, S., Singh-Peterson, L., & Smith, T. F. (2016). Interrogating resilience: Toward a typology to improve its operationalization. *Ecology and Society*, *21*(2), 27. https://doi.org/10.5751/ES-08450-210227.

Desouza, K. C., & Flanery, T. H. (2013). Designing, planning, and managing resilient cities: A conceptual framework. *Cities*, *35*, 89–99. https://doi.org/10.1016/j.cities.2013.06.003

De Vos, A., Cumming, G. S., & Roux, D. J. (2017). The relevance of cross-scale connections and spatial interactions for ecosystem service delivery by protected areas: Insights from Southern Africa. *Ecosystem Services*, *28*, 133–139. https://doi.org/10.1016/j.ecoser.2017.11.014

Duro, J. A., Perez-Laborda, A., Turrion-Prats, J., & Fernández-Fernández, M. (2021). COVID-19 and tourism vulnerability. *Tourism Management Perspectives*, *38*, 100819. https://doi.org/10.1016/j.tmp.2021.100819

Espiner, S., & Becken, S. (2014). Tourist towns on the edge: Conceptualising vulnerability and resilience in a protected area tourism system. *Journal of Sustainable Tourism*, *22*(4), 646–665. https://doi.org/10.1080/09669582.2013.855222

Etkind, S. N., Bone, A. E., Lovell, N., Cripps, R. L., Harding, R., Higginson, I. J., & Sleeman, K. E. (2020). The role and response of palliative care and hospice services in epidemics and pandemics: A rapid review to inform practice during the COVID-19 pandemic. *Journal of Pain and Symptom Management*, *60*(1), e31–e40. https://doi.org/10.1016/j.jpainsymman.2020.03.029

Ferreira, V., Barreira, A. P., Loures, L., Antunes, D., & Panagopoulos, T. (2020). Stakeholders' engagement on nature-based solutions: A systematic literature review. *Sustainability*, *12*(2), 640. https://doi.org/10.3390/su12020640

Florido-Benítez, L. (2021). The effects of COVID-19 on Andalusian tourism and aviation sector. *Tourism Review*, *76*(4), 829–857. https://doi.org/10.1108/TR-12-2020-0574

Fotiadis, A., Polyzos, S., & Huan, T. C. T. (2021). The good, the bad and the ugly on COVID-19 tourism recovery. *Annals of Tourism Research*, *87*, 103117. https://doi.org/10.1016/j.annals.2020.103117

Franco-Gaviria, F., Amador-Jiménez, M., Millner, N., Durden, C., & Urrego, D. H. (2022). Quantifying resilience of socio-ecological systems through dynamic Bayesian networks. *Frontiers in Forests and Global Change*, *5*, 889274. https://doi.org/10.3389/ffgc.2022.889274

Fusch, P. I., & Ness, L. R. (2015). Are we there yet? Data saturation in qualitative research. *The Qualitative Report*, *20*(9), 1408–1416. https://doi.org/10.46743/2160-3715/2015.2281

Gallopín, G. C. (2006). Linkages between vulnerability, resilience, and adaptive capacity. *Global Environmental Change*, *16*(3), 293–303. https://doi.org/10.1016/j.gloenvcha.2006.02.004

García-Melón, M., Gómez-Navarro, T., & Acuña-Dutra, S. (2010). An anp approach to assess the sustainability of tourist strategies for the coastal national parks of Venezuela / venesuelos payrates nacionalinių parkų darnaus turizmo strategijų vertinimas atp metodu. *Technological and Economic Development of Economy*, *16*(4), 672–689. https://doi.org/10.3846/tede.2010.41

Geng, C., Harshaw, H., Wu, W., & Wang, G. (2023). Impacts of COVID-19 on tourism and management response from Banff National Park, Canada. *Journal of Forestry Research*, *34*(5), 1229–1244. https://doi.org/10.1007/s11676-022-01580-4

Geng, D., Innes, J., Wu, W., & Wang, G. (2021). Impacts of COVID-19 pandemic on urban park visitation: A global analysis. *Journal of Forestry Research*, *32*(2), 553–567. https://doi.org/10.1007/s11676-020-01249-w

Giousmpasoglou, C., Marinakou, E., & Zopiatis, A. (2021). Hospitality managers in turbulent times: The COVID-19 crisis. *International Journal of Contemporary Hospitality Management*, *33*(4), 1297–1318. https://doi.org/10.1108/IJCHM-07-2020-0741

Glaser, M., & Glaeser, B. (2014). Towards a framework for cross-scale and multi-level analysis of coastal and marine social-ecological systems dynamics. *Regional Environmental Change*, *14*(6), 2039–2052. https://doi.org/10.1007/s10113-014-0637-5

Goodell, J. (2020). COVID-19 and finance: Agendas for future research. *Finance Research Letters*, *35*(1), 101512. https://doi.org/10.1016/j.frl.2020.101512

Guest, G., Namey, E. E., & Chen, M. (2020). A simple method to assess and report thematic saturation in qualitative research. *PLoS ONE*, *15*(5), e0232076. https://doi.org/10.1371/journal.pone.0232076

Gumilang, A., Dolorosa, E., & Kurniati, D. (2021). Corporate social responsibility program in ecotourism development of Mempawah Mangrove Park. *SOCA: Jurnal Sosial, Ekonomi Pertanian*, *15*(2), 245. https://doi.org/10.24843/soca.2021.v15.i02.p02

Guo , W, & Chung, S. (2016). *Remaking tourism carrying capacity frameworks for geoparks* [Conference session]. Proceedings of 4th international conference on advances in social science, Humanities, and Management (ASSHM 2016) (pp. 197–205).

Henseler, M., Maisonnave, H., & Maskaeva, A. (2022). Economic impacts of COVID-19 on the tourism sector in Tanzania. *Annals of Tourism Research Empirical Insights*, *3*(1), 100042. https://doi.org/10.1016/j.annale.2022.100042

Herrero, M., & Kraemer, S. (2022). Beyond survival mode: Organizational resilience capabilities in nonprofit arts and culture fundraising during the COVID-19 pandemic. *Nonprofit Management and Leadership*, *33*(2), 279–295. https://doi.org/10.1002/nml.21524

Hockings, M., Dudley, N., & Elliott, W. (2020). Editorial essay: COVID-19 and protected and conserved areas. *Parks*, *26*(1), 7–24.

Hoffmann, S. (2022). Challenges and opportunities of area-based conservation in reaching biodiversity and sustainability goals. *Biodiversity and Conservation*, *31*(2), 325–352. https://doi.org/10.1007/s10531-021-02340-2

Holling, C. S., & Gunderson, L. H. (2001). Resilience and adaptive cycles. In L. H. Gunderson & C. S. Holling (Eds.), *Panarchy: Understanding transformation in human and natural systems* (pp. 25–62). Island Press.

Jahn, J. L., & Johansson, C. (2018). The communicative constitution of adaptive capacity during Sweden's Västmanland wildfire. *Corporate Communications: An International Journal*, *23*(2), 162–179. https://doi.org/10.1108/CCIJ-04-2017-0031

Jeon, C. Y., & Yang, H. W. (2021). The structural changes of a local tourism network: Comparison of before and after COVID-19. *Current Issues in Tourism*, *24*(23), 3324–3338. https://doi.org/10.1080/13683500.2021.1874890

Jones, P., & Comfort, D. (2020). The COVID-19 crisis and sustainability in the hospitality industry. *International Journal of Contemporary Hospitality Management*, *32*(10), 3037–3050. https://doi.org/10.1108/IJCHM-04-2020-0357

Jones, N., & McGinlay, J. (2020). The impact of COVID-19 restrictions on local communities of Peak District National Park and management options during the pandemic. Fidelio Report no. 2. https://www.fidelio.landecon.cam.ac.uk/files/peak_district_report_final.pdf

Kim, J., Ko, Y., Kim, W., Kim, G., Lee, J., Eyman, O. T. G., Chowdhury, S., Adiwal, J., Son, Y., & Lee, W. K. (2023). Understanding the impact of the COVID-19 pandemic on the perception and use of urban

green spaces in Korea. *International Journal of Environmental Research and Public Health*, *20*(4), 3018. https://doi.org/10.3390/ijerph20043018

Kontogiannis, T. (2021). A qualitative model of patterns of resilience and vulnerability in responding to a pandemic outbreak with system dynamics. *Safety Science*, *134*, 105077. https://doi.org/10.1016/j.ssci.2020.105077

Kuntz, J. C. (2021). Resilience in times of global pandemic: Steering recovery and thriving trajectories. *Applied Psychology*, *70*(1), 188. https://doi.org/10.1111/apps.12296

Kupfer, J., Li, Z., Ning, H., & Huang, X. (2021). Using mobile device data to track the effects of the COVID-19 pandemic on spatiotemporal patterns of national park visitation. *Sustainability*, *13*(16), 9366. https://doi.org/10.3390/su13169366

Lew, A. A. (2014). Scale, change and resilience in community tourism planning. *Tourism Geographies*, *16*(1), 14–22. https://doi.org/10.1080/14616688.2013.864325

Lingua, F., Coops, N., Lafond, V., Gaston, C., & Griess, V. (2022). Characterizing, mapping and valuing the demand for forest recreation using crowdsourced social media data. *PLoS One*, *17*(8), e0272406. https://doi.org/10.1371/journal.pone.0272406

Litvin, S. W. (2020). Review and commentary tourism and peace: A review and commentary. *Tourism Review International*, *23*(3), 173–181. https://doi.org/10.3727/154427219X15741004672675

Lo, M. C. M., & Hsieh, H. Y. (2020). The "Societalization" of pandemic unpreparedness: Lessons from Taiwan's COVID response. *American Journal of Cultural Sociology*, *8*(3), 384–404. https://doi.org/10.1057/s41290-020-00113-y

Mayer, M. (2014). Can nature-based tourism benefits compensate for the costs of national parks? A study of the Bavarian Forest National Park, Germany. *Journal of Sustainable Tourism*, *22*(4), 561–583. https://doi.org/10.1080/09669582.2013.871020

Maziar, P., Maher, A., Alimohammadzadeh, K., Jafari, M., & Hosseini, S. M. (2022). Identifying the preparedness components in COVID-19: Systematic literature review. *Journal of Education and Health Promotion*, *11*(1), 385. https://doi.org/10.4103/jehp.jehp_28_22.

McEntire, D. A. (2021). *Disaster response and recovery: Strategies and tactics for resilience*. Wiley.

McGinlay, J., Gkoumas, V., Holtvoeth, J., Fuertes, R. F. A., Bazhenova, E., Benzoni, A., Botsch, K., Martel, C. C., Sánchez, C. C., Cervera, I., Chaminade, G., Doerstel, J., García, C. J. F., Jones, A., Lammertz, M., Lotman, K., Odar, M., Pastor, T., Ritchie, C., … Jones, N. (2020). The impact of COVID-19 on the management of European protected areas and policy implications. *Forests*, *11*(11), 1214. https://doi.org/10.3390/f11111214

McNeely, J. A. (2021). Nature and COVID-19: The pandemic, the environment, and the way ahead. *Ambio*, *50*(4), 767–781. https://doi.org/10.1007/s13280-020-01447-0

Miller-Rushing, A. J., Athearn, N., Blackford, T., Brigham, C., Cohen, L., Cole-Will, R., Edgar, T., Ellwood, E. R., Fisichelli, N., Pritz, C. F., Gallinat, A. S., Gibson, A., Hubbard, A., McLane, S., Nydick, K., Primack, R. B., Sachs, S., & Super, P. E. (2021). COVID-19 pandemic impacts on conservation research, management, and public engagement in US national parks. *Biological Conservation*, *257*, 109038. https://doi.org/10.1016/j.biocon.2021.109038

Norris, F. H., Stevens, S. P., Pfefferbaum, B., Wyche, K. F., & Pfefferbaum, R. L. (2008). Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal of Community Psychology*, *41*(1–2), 127–150. https://doi.org/10.1007/s10464-007-9156-6

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, *16*(1), 1609406917733847. https://doi.org/10.1177/1609406917733847

Onstad, P., Danes, S., Hardman, A., Olson, P., Marczak, M., Heins, R., Croymans, S., & Coffee, K. (2012). The road to recovery from a natural disaster: Voices from the community. *Community Development*, *43*(5), 566–580. https://doi.org/10.1080/15575330.2012.699081

Orîndaru, A., Popescu, M. F., Alexoaei, A. P., Căescu, ŞC, Florescu, M. S., & Orzan, A. O. (2021). Tourism in a post-COVID-19 era: Sustainable strategies for industry's recovery. *Sustainability*, *13*(12), 6781. https://doi.org/10.3390/su13126781

Patterson, J. M., & Mccubbin, H. I. (1983). The impact of family life events and changes on the health of a chronically ill child. *Family Relations*, *32*, 255–264. https://doi.org/10.2307/584685

Peakdistricknationalpark (PDNP). (2023). https://www.peakdistrict.gov.uk/learning-about/news/mediacentrefacts

Pich, M. T., Loch, C. H., & Meyer, A. D. (2002). On uncertainty, ambiguity, and complexity in project management. *Management Science*, *48*(8), 1008–1023. https://doi.org/10.1287/mnsc.48.8.1008.163

Priyadarsini, S. L., Suresh, M., & Huisingh, D. (2020). What can we learn from previous pandemics to reduce the frequency of emerging infectious diseases like COVID-19? *Global Transitions*, *2*, 202–220. https://doi.org/10.1016/j.glt.2020.09.003

Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B., & Xu, Y. (2020). A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: Implications and policy recommendations. *General Psychiatry*, *33*(2), e100213.

Raassens, N., Haans, H., & Mullick, S. (2022). Surviving the hectic early phase of the COVID-19 pandemic: A qualitative study of the supply chain strategies of food service firms in times of a crisis. *The International Journal of Logistics Management*, *33*(3), 877–900. https://doi.org/10.1108/IJLM-01-2021-0013

Raetze, S., Duchek, S., Maynard, M. T., & Wohlgemuth, M. (2022). Resilience in organization-related research: An integrative conceptual review across disciplines and levels of analysis.. *Journal of Applied Psychology*, *107*(6), 867. https://doi.org/10.1037/apl0000952

Religa, P., & Adach, S. (2020). The problem of solid waste on the tourist trails of Tatra National Park, Poland. *Eco. Mont (Journal on Protected Mountain Areas Research*, *12*(1), 35–42. https://doi.org/10.1553/eco.mont-12-1s35

Ritchie, H. (2020). Google mobility trends: How has the pandemic changed the movement of people around the world? *Our World in Data.* 2 June 2020. Retrieved October 10, 2024, from https://ourworldindata.org/covid-mobility-trends#parks-and-outdoor-spaces

Rogowski, M. (2020). Monitoring system of tourist traffic (mstt) for tourists monitoring in mid-mountain national park, sw poland. *Journal of Mountain Science*, *17*(8), 2035–2047. https://doi.org/10.1007/s11629-019-5965-y

Romagosa, F., Eagles, P. F., & Lemieux, C. J. (2015). From the inside out to the outside in: Exploring the role of parks and protected areas as providers of human health and well-being. *Journal of Outdoor Recreation and Tourism*, *10*, 70–77. https://doi.org/10.1016/j.jort.2015.06.009

Ruiz-Ballesteros, E., & del Campo Tejedor, A. (2020). Community-based tourism as a factor in socio-ecological resilience. *Economic Diversification and Community Participation in Floreana (Galapagos). Sustainability*, *12*(11), 4724.

Saja, A. A., Goonetilleke, A., Teo, M., & Ziyath, A. M. (2019). A critical review of social resilience assessment frameworks in disaster management. *International Journal of Disaster Risk Reduction*, *35*, 101096. https://doi.org/10.1016/j.ijdrr.2019.101096

Salehzadeh Niksirat, K., Goswami, L., Rao, P. S. B., Tyler, J., Silacci, A., Aliyu, S., Aebli, A., Wacharamanotham, C., & Cherubini, M. (2023, April). *Changes in research ethics, openness, and transparency in empirical studies between CHI 2017 and CHI 2022* [Conference session]. Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (pp. 1–23). https://doi.org/10.1145/3544548.3580848.

Scholtz, M., & Saayman, M. (2018). Diving into the consequences of stakeholders unheard. *European Journal of Tourism Research*, *20*, 105–124. https://doi.org/10.54055/ejtr.v20i.343

Shaker, M., & Hermans, E. (2021). Identification of key measures to promote and enhance cycling for visiting national parks: A case study of peak district national park, England. *Journal of Outdoor Recreation and Tourism*, *35*(2021), 100406. https://doi.org/10.1016/j.jort.2021.100406

Shehzad, K., Xiaoxing, L., Bilgili, F., & Koçak, E. (2021). COVID-19 and spillover effect of global economic crisis on the United States' financial stability. *Frontiers in Psychology*, *12*, 632175. https://doi.org/10.3389/fpsyg.2021.632175

Shrestha, U. B., Shrestha, B. R., Maharjan, S., Dhungel, U., Shrestha, S., Lamichhane, B. R., & Shrestha, B. B. (2023). Impacts of COVID-19 on conservation programs and research activities in Nepal. *Global Ecology and Conservation*, *46*, e02628. https://doi.org/10.1016/j.gecco.2023.e02628

Singh, C., van der Ent, R., Wang-Erlandsson, L., & Fetzer, I. (2022). Hydroclimatic adaptation critical to the resilience of tropical forests. *Global Change Biology*, *28*(9), 2930–2939. https://doi.org/10.1111/gcb.16115

Smith, M. K. S., Smit, I. P., Swemmer, L. K., Mokhatla, M. M., Freitag, S., Roux, D. J., & Dziba, L. (2021). Sustainability of protected areas: Vulnerabilities and opportunities as revealed by COVID-19 in a national park management agency. *Biological Conservation*, *255*, 108985. https://doi.org/10.1016/j.biocon.2021.108985

Soriano, G. (2019). Disaster risk reduction knowledge among local people in a selected community in the Philippines. *Journal of Health and Caring Sciences*, *1*(2), 92–99. https://doi.org/10.37719/jhcs.2019.v1i2.oa007

South African National Parks. (2024). https://www.sanparks.org/wp-content/uploads/2024/06/SANParks-Annual-Performance-Plan-2024-2025.pdf Date of access: 24 October 24.

Souza, C. N., Rodrigues, A. C., Correia, R. A., Normande, I. C., Costa, H. C., Guedes-Santos, J., Malhado, A. C., Carvalho, A. R., & Ladle, R. J. (2021). No visit, no interest: How COVID-19 has affected public interest in the world's national parks. *Biological Conservation*, *256*, 109015. https://doi.org/10.1016/j.biocon.2021.109015

Spenceley, A., McCool, S., Newsome, D., Báez, A., Barborak, J. R., Blye, C.-J., Bricker, K., Sigit Cahyadi, H., Corrigan, K., Halpenny, E., Hvenegaard, G., Malleret King, D., Leung, Y.-F., Mandić, A., Naidoo, R., Rüede, D., Sano, J., Sarhan, M., Santamaria, V., … Zschiegner, A.-K. (2021). Tourism in protected and conserved areas amid the COVID-19 pandemic. *Parks*, (27), 103–118. https://doi.org/10.2305/IUCN.CH.2021.PARKS-27-SIAS.en

Stanic-Jovanovic, S., & Cvetković, M. (2016). Education through excursions in the function of sustainable development of tourism in the case of national park djerdap. *Zbornik Radova - Geografski Fakultet Univerziteta U Beogradu*, *64*(64), 401–417. https://doi.org/10.5937/zrgfub1664401s

Statistics South Africa (statssa) (2019). Covid-19 pandemic In South Africa demography volume 2020. Retrieved from October 6, 23, from http://www.statssa.gov.za/publications/Report%2000-80-05/Report%2000-80-052020.pdf

Strickland-Munro, J. K., Allison, H. E., & Moore, S. A. (2010). Using resilience concepts to investigate the impacts of protected area tourism on communities. *Annals of Tourism Research*, *37*(2), 499–519. https://doi.org/10.1016/j.annals.2009.11.001

Tambo, E., Djuikoue, I. C., Tazemda, G. K., Fotsing, M. F., & Zhou, X. N. (2021). Early stage risk communication and community engagement (RCCE) strategies and measures against the coronavirus disease 2019 (COVID-19) pandemic crisis. *Global Health Journal*, *5*(1), 44–50. https://doi.org/10.1016/j.glohj.2021.02.009

Tanaka, T., & Takashina, N. (2023). Governance paradox: Implications from Japan's national parks for managing complex protected areas. *Sustainability Science*, *18*(4), 1995–2007. https://doi.org/10.1007/s11625-023-01332-1

Templeton, A. J., Goonan, K., & Fyall, A. (2021). COVID-19 and its impact on visitation and management at US national parks. *International Hospitality Review*, *35*(2), 240–259. https://doi.org/10.1108/IHR-08-2020-0039

Tong, A., Flemming, K., McInnes, E., Oliver, S., & Craig, J. (2012). Enhancing transparency in reporting the synthesis of qualitative research: ENTREQ. *BMC Medical Research Methodology*, *12*(1), 1–8. https://doi.org/10.1186/1471-2288-12-181

Toubes, D. R., Araújo Vila, N., & Fraiz Brea, J. A. (2021). Changes in consumption patterns and tourist promotion after the COVID-19 pandemic. *Journal of Theoretical and Applied Electronic Commerce Research*, *16*(5), 1332–1352. https://doi.org/10.3390/jtaer16050075

Trang, N. M., McKenna, B., Cai, W., & Morrison, A. M. (2023). I do not want to be perfect: Investigating generation Z students' personal brands on social media for job seeking. *Information Technology & People*, *37*(3), 793–814. https://doi.org/10.1108/ITP-08-2022-0602.

Walker, B., Holling, C. S., Carpenter, S. R., & Kinzig, A. (2004). Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society*, *9*(2), 5. https://doi.org/10.5751/ES-00650-090205.

Wendt, C., Adam, M., Benlian, A., & Kraus, S. (2021). Let's connect to keep the distance: How SMEs leverage information and communication technologies to address the COVID-19 crisis. *Information Systems Frontiers*, *24*, 1061–1079.

Wickes, R., Zahnow, R., & Taylor, M. (2015). Neighborhood structure, social capital, and community resilience: Longitudinal evidence from the 2011 Brisbane flood disaster*. *Social Science Quarterly*, *96*(2), 330–353. https://doi.org/10.1111/ssqu.12144

Wilgen, B. W. (2018). Research, politics, and conservation in South Africa's national parks. *South African Journal of Science*, *114*(9–10), 1–2. https://doi.org/10.17159/sajs.2018/a025

Winter, P. L., Selin, S., Cerveny, L., & Bricker, K. (2020). Outdoor recreation, nature-based tourism, and sustainability. *Sustainability*, *12*(1), 81. https://doi.org/10.3390/su12010081

Zhang, F., Lv, Y., & Sarker, M. N. I. (2024). Resilience and recovery: A systematic review of tourism governance strategies in disaster-affected regions. *International Journal of Disaster Risk Reduction*, *103*, 104350. https://doi.org/10.1016/j.ijdrr.2024.104350