Collaborative Networks in Tourism Disaster Management: A Case Study of Rural, Nature-based Destinations in New Zealand

Keywords: natural hazards, tourism destinations, emergency management, collaboration, social network analysis

Extended Abstract

Tourism destinations in remote and geologically active regions are highly exposed to natural hazards that can disrupt infrastructure, endanger visitors, and threaten local economies. In Aotearoa New Zealand, Piopiotahi/Milford Sound and Tāhuna/Queenstown are particularly vulnerable due to their isolation, heavy visitor flows, and proximity to the Alpine Fault [1]. Collaboration between tourism stakeholders and emergency management organisations is critical to effective disaster preparedness, response, and recovery. Yet, little is known about how such collaboration is enacted in practice or how inter-organisational networks are structured.

This study employs a sequential mixed-method Social Network Analysis to examine inter-organisational collaboration in two destination-level disaster preparedness groups: the Fiordland Hazard Working Group (FHWG) and the Tourism Operator Responders of Queenstown (TORQUE). Semi-structured interviews (n=29) explored how stakeholders understand and enact collaboration. Interview data was analysed thematically identifying five key types of ties: acquaintance, communication, resource sharing, business relations, and formal agreements. These categories informed a network survey administered face-to-face to all 41 organisations affiliated with the two groups, with 24 organisations responding (58% response rate). Network properties were analysed using Gephi, UCINET, and Networkx.

Findings show that the FHWG and TORQUE networks have high clustering coefficients (0.55–0.64) and short average path lengths (<2), indicating willingness to collaborate. The networks also display some features of well-connected and resilient systems - high density, a core–periphery structure, and multiplexity -which support adaptation to uncertainty and change ([2]). Emergency Management Organisations and Regional Tourism Organisations play a key role as central and brokering actors, linking otherwise disconnected actors. Theoretically, these results provide quantitative evidence that DMOs have evolved beyond marketing to take on strategic management roles, facilitating connections and promoting disaster preparedness. While emergency management organisations hold primary responsibility, the study demonstrates that tourism stakeholders are integral to effective disaster management and thus should be formalised in emergency planning.

Ethical considerations

All participants provided informed consent. Anonymity was ensured through coded identifiers, and data access was limited to the research team. To enhance credibility, participants reviewed and validated their interview transcripts. The study received approval from the University of REDACTED Human Ethics Committee.

References

[1] Orchiston, C., Mitchell, J., Wilson, T., Langridge, R., Davies, T., Bradley, B., Johnston, D., Davies, A., Becker, J., & McKay, A. (2018). Project AF8: Developing a coordinated, multi-agency response plan for a future great Alpine Fault earthquake. *New Zealand Journal of Geology and Geophysics*, *61*(3), 389–402.

[2] Bodin, O., & Crona, B. I. (2009). The role of social networks in natural resource governance: What relational patterns make a difference? *Global Environmental Change*, *19*(3), 366–374.

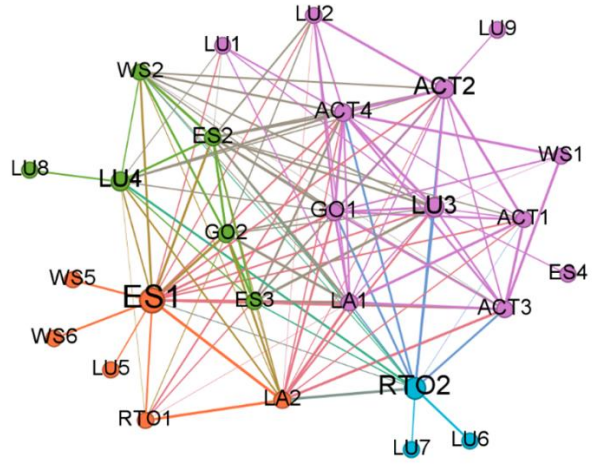

Figure 1. **Fiordland Hazard Working Group (FHWG) collaborative network**.

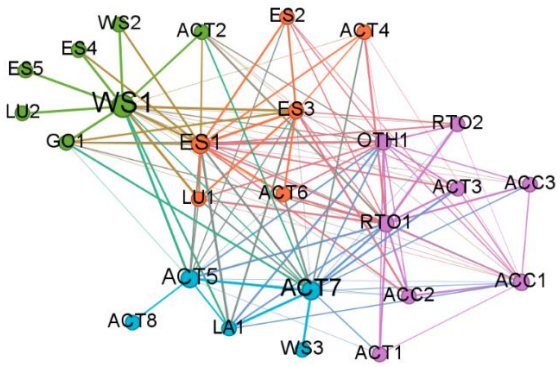

Figure 2. **Tourism Operator Responders Queenstown (TORQUE) collaborative network.**

Nodes represent individual organisations, coded by their emergency management or tourism business category (eg. ES=Emergency Service, ACT=Activities etc.). Node size represents betweenness centrality, and node colors represent clusters of interconnected nodes. Links between the nodes represent collaborative relations drawn from the interview findings. Line thickness represents the strength of the relationship.

Table 1. **Networks Global Properties (Isolates Excluded).**

Property	Fiordland Hazard Working Group	Tourism Operator Responders Queenstown
Type of network	Undirected	Undirected
Nodes	27	26
Edges	169	132
Avg. Degree	12.52	10.15
Diameter	4	3
Density	0.48	0.41
Avg. Clustering Coef.	0.55	0.64
Avg. Path Length	1.79	1.70