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To cite this article: Stephen Schweinsberg & C. Michael Hall (15 Oct 2024): Sherpas and Sagarmatha: complexity theory, 'Edge of Chaos' and implications for tourism risk management, Tourism Recreation Research, DOI: [10.1080/02508281.2024.2410584](https://doi.org/10.1080/02508281.2024.2410584)

To link to this article: <https://doi.org/10.1080/02508281.2024.2410584>



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Published online: 15 Oct 2024.



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Sherpas and Sagarmatha: complexity theory, 'Edge of Chaos' and implications for tourism risk management

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ABSTRACT

Sagarmatha (Everest) has long been recognised as one of the principal goals of global adventure tourism. Supported by high-altitude workers, paying climbers on Sagarmatha have the opportunity to tread in the footsteps of colonial pioneers such as George Mallory and Sir Edmund Hillary. Ever since the first attempt was made to summit Sagarmatha there has been an appreciation amongst the climbing community of the risks involved. However, approaches to risk management on Sagarmatha have often not considered the social and cultural circumstances around a climbing expedition's relationship to its local support staff. This paper uses the notion of an 'edge of chaos' to explore the evolving relationship between climbers and other stakeholders on Sagarmatha. Then, through reference to Holling's (2001) adaptive cycle and concept of panarchy, we consider on what basis might one stakeholder on Sagarmatha impose a greater risk burden on another stakeholder.

ARTICLE HISTORY

Received 1 March 2024
Accepted 17 September 2024

KEYWORDS

Risk management; complexity; 'Edge of Chaos'; panarchy; Sagarmatha

Introduction

The 2023 Everest (hereafter known as Sagarmatha) spring climbing season set a number of records: 478 climbing permits were issued to foreign travellers with approximately 600 people reaching the summit; Kami Rita Sherpa summited the mountain for a record 28th time, and Rafa Jaime was the first blind climber from Mexico to reach the summit (Arnette, 2023). At the same time, however, the 2023 season was also recognised as the 'deadliest on record': twelve climbers have been confirmed dead with five currently unaccounted for but assumed lost (Heaven Himalaya, 2023). Risk of serious injury or death has long been a reality in high-altitude climbing and is a common theme throughout the adventure tourism literature with travellers often undertaking activities that deliberately put them in harm's way (Dickson & Dolnicar, 2004; Mitchell, 1983; Wang et al., 2019). The role of an adventure tourism provider is to feed a traveller's risk appetite while simultaneously minimising the absolute risk posed to customers (Musa et al., 2015; Sand & Gross, 2019).

Risk management on Sagarmatha and other mountain peaks forms part of a larger body of scholarship on tourism risk management, which has developed

over the last decade in response to the effects of the COVID-19 pandemic and a number of other human made and natural crises / disasters including floods, bushfires and terror attacks (Beirman, 2021; Prideaux & Beirman, 2024; Ritchie, 2009; Schweinsberg et al., 2020). Existing risk management models, which are typically based on assessments of the probability and likely severity posed by a crisis event (Paraskevas, 2022) have been criticised on the basis that they have tended to 'propose a linear, prescriptive framework from prediction through to post-event recovery as a universally applicable response to tourism crises and disasters' (Speakman & Sharpley, 2012, pp. 67–68). Such approaches to risk management belie the complexity of tourism systems and the ways in which a wider range of dynamic cultural, socio-political, organisational and environmental forces impact on how we assess and respond to risk. Speakman and Sharpley (2012) proposed that complexity theory can be used to more comprehensively understand and respond to risk. In this paper, we will build on this work and examine the Sagarmatha climbing environment through the lens of an 'edge of chaos' perspective, which is common in the complexity theory literature (see McKercher, 1999;

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Zenker & Kock, 2020). Speakman and Sharpley (2012) have argued that when a tourism environment that is operating on the 'edge of chaos' is subject to a trigger event (the so-called butterfly effect) such as a volcanic eruption or in our case an avalanche or earthquake; it is essential that it learns from its environment. By learning we are able to become more resilient and adaptable to change.

The central premise of this paper is that owing to its extreme natural features, Sagarmatha will likely always be at risk of disruption and change. For the climbing industry to respond to future threats it must embrace the complex nature of the physical and social world; recognising that Sagarmatha is 'a place of intense learning, innovation and creativity where change can occur easily and spontaneously as the system breaks with the past and new systems of order emerge' (Stevenson, 2013, p. 88). As an industry we must recognise that we adapt to change through a process, which traditionally has been described as a 'period of rapid growth, conservation, release, and reorganisation, followed again by rapid growth' (Holling, 2001; in Hall, 2018, p. 40). However, how this process manifests itself will be determined by our ability to embrace the complexity that exists around us, to recognise the presence of multiple adaptancy processes at different scales (the notion of panarchy). With reference to the literature on panarchy, the present paper will suggest that the climbing industry needs to be willing to wrestle with complex ethical questions including whether we have the right to impose risks on sherpas? We will consider this question through a framework of risk imposition proposed by Song (2019).

Risk management in tourism and chaos theory

Risk management in tourism destinations is a 'process through which travel and tourism organisations proactively identify, evaluate and address factors, hazards and events that may potentially threaten the achievement of their strategic objectives or even their survival' (Paraskevas, 2022, p. 735). By developing quantifiable expressions of both the likelihood and level of impact of an internal or externally generated crisis event, planners can fulfil their legislative responsibilities and instil in their participants the understanding that whilst 'risk' is inherent in many tourism-related activities; the degree to which they will threaten the viability of the enterprise or destination is being controlled and accounted for (Ritchie, 2009). When tourism managers have traditionally considered risk, they have done so on the basis of a linear approach to risk assessment –

sensing the risk landscape; risk assessment (identification and evaluation); and treatment (avoidance, mitigation, acceptance, transfer) (see Paraskevas & Quek, 2019). However, what of situations on Sagarmatha where it is often difficult to assess risk against any statistical measure given the randomness of the outcomes (see descriptions of traveller experiences in Horrell, 2021, pp. 71–72; Khadka, 2022)? As Mingma Sherpa observed:

Our Camp II was set, and we were about to take the equipment to the upper camp. I woke up at 3:00 am and at around 6:00 am the ladder on the way was broken ... The place was congested. All of a sudden, an avalanche came. If the avalanche came fifteen minutes or twenty minutes before then it would have killed around sixty or seventy people. We were in the middle and at that time I heard the noise and saw it coming from above. After that I was buried by the snow. I could not remember what else happened there ... I had so much pain on my head, so I was taken to Lukla from Basecamp via Helicopter. From Lukla, I was taken to Kathmandu by airplane to the B & B hospital ... Lots of Sherpas died on the same day so everyone decided not to continue ... Since that route was not safe, we were not ready to risk our life. Many Sherpas died there (Mingma Sherpa, 2015 interview, in Miller, 2017, p. 204).

The unpredictability of tourism destinations such as Sagarmatha complicates its systems nature. Tourism academia has a long-utilized system thinking as a means of demonstrating how the industry works and the various internal and external forces that act on its outcomes (Brandao et al., 2022; Leiper, 1989; Santos et al., 2022; Sessa, 1988). Over the last few decades, this analysis has extended to seeing systems as complex, drawing on the principles of chaos and complexity theories as a way of understanding tourism system's nonlinear and nondeterministic nature in different tourism destination and planning settings (Hall et al., 2018; Huang & Bahja, 2022; McKercher, 1999; Stevenson, 2013; Zenker & Kock, 2020). To-date, however, complexity theory has received only minimal attention with respect to the study of tourism risk (an exception being Speakman & Sharpley, 2012). Instead, risk management has tended to premise linear models of cause and effect; e.g. 'risk is merely the combination of probability and impact' (Emblemsvåg, 2020, p. 39); assuming that the destination can be managed through prescriptive and highly rigid management plans (Speakman & Sharpley, 2012).

Speakman and Sharpley (2012) suggested that when a destination is recognised as operating on the 'edge of chaos' we are forced to explore innovative approaches to change. An 'edge of chaos' environment is one

where complex adaptive system teeter on the dividing line between order and disorder. It is analogous to a pile of sand balanced to the limit of its capacity on a table-top; one where 'the adhesive friction between the sand grains is taxed to the limits of its tolerability' (Russell & Faulkner, 2004, p. 558). When that one additional grain of sand is then added to the pile and becomes the straw that breaks the proverbial camel's back, and the system can collapse. In a tourism destination trigger events can include natural disasters, terror attacks or health pandemic such as COVID-19 (Speakman & Sharples, 2012; Walwyn, 2020). All environments that operate on the 'edge of chaos' have the potential 'self-heal' through the reorganisation of the system (Russell, 2006). As Harri-Augstein (in Battram, 1999, p. 145) noted:

Learning operates on the edge of chaos, somewhere between a stable system of order and unstable system of disorder! It is here that personal meaning, a person's system of personal knowing, gets constructed. At the two extremes of the behaviour of all systems order and chaos pervades. Between these two extremes, at the edge of chaos, one finds complexity! This is a class of behaviors in which the components of the system are neither unstable, nor in a state of randomness. Complexity is now organized as the state that allows information to organize and reorganize itself to increasing levels of sophistication. The state that allows the person to construct new and more complex meanings.

However, at the same time as new and complex meanings are established, there is no expectation that the 'edge of chaos' will necessarily be resolved in a way that leads to predictability, regularity, and stability for people in the future (Stevenson, 2013). As such, it is necessary to see environments operating on the 'edge of chaos' in the context of the wider adaptive processes whereby people respond to changes in the ecological, economic, and social systems of which they are a part.

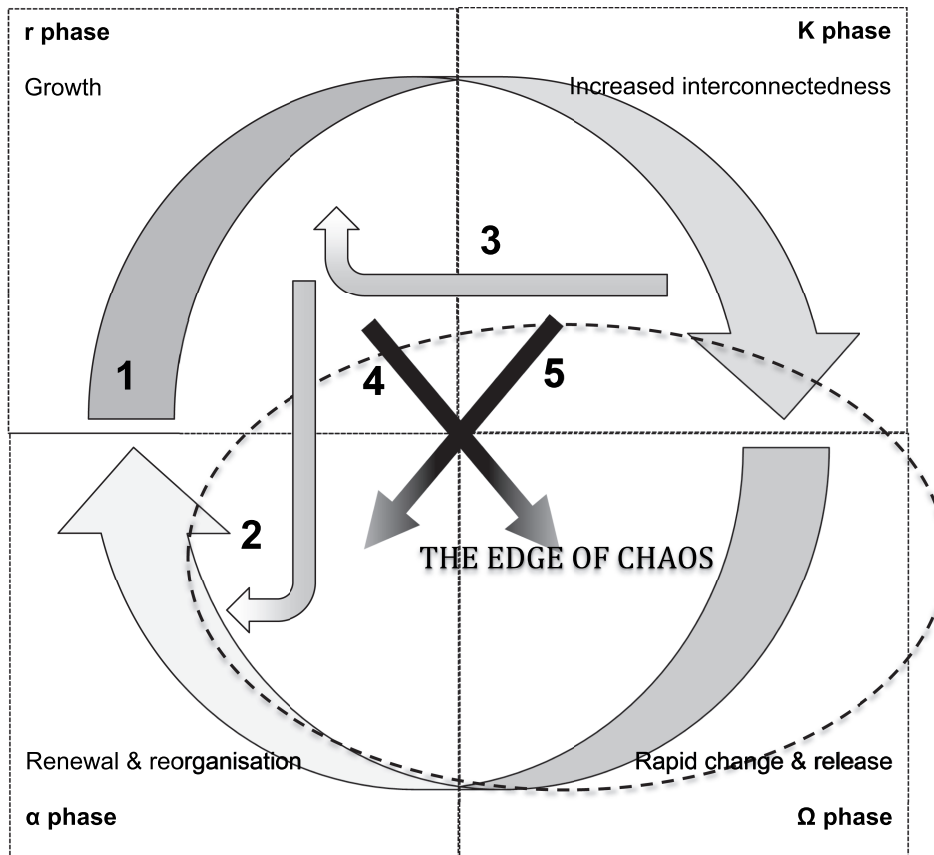
Figure 1, which is based on earlier work from Holling (2001) and Hall (2018) illustrates the various paths that an adaptive cycle may take. A period of growth (*r phase*), which in the case of Sagarmatha might include the evolution of the natural conditions on the mountain and the evolution of the tourism industry infrastructure, government policies and local populations to facilitate access to the mountain. As these various forces come together we come to the *k phase*, which is a time of increased interconnectedness but also a time where each of the disparate ecological, organisational and social forces can lead to problems if not properly managed or if they are subjected to what Holling referred to as a trigger event (Holling, 2001). Triggers on Sagarmatha include a natural event like an earthquake or landslide, which results in a Ω phase. In

this phase, the interconnectedness between ecological and social forces will be subject to either renewal or reorganisation (the *a phase*) before providing a new normal for the next stage of growth (the *r phase*). It should be noted that the process is not linear, nor does it necessarily operate in only one direction. In Figure 1 the adaptive cycle has two opposing loops or states: a development or fore loop characterised by stability and a back or release and reorganisation loop characterised by uncertainty in which destructive change in the system is most likely to occur (Walker & Salt, 2012).

Sagarmatha, tourism and risk management

Sagarmatha is the highest mountain in the world standing at 8,849 m above sea level and straddles the borders of Nepal, China, and Tibet. It has long been a focus of Western adventurers (Storti, 2021) and the mountain was first summited by Tenzing Norgay and Sir Edmund Hillary in 1953. In more recent times Sagarmatha has become a focal point for adventure tourism (Buckley, 2006). Although temporarily curtailed by the COVID-19 pandemic, the climbing of Sagarmatha remains a major economic earner for the Nepalese government which collects revenues from a range of climbing operations (Nyaupane, 2015) – 93 million rupees were collected from climbing permits in December 2022, up from 40.6 million in 2021 (Mt. Everest Today, 2022). In 2019, the Nepalese tourism industry contributed some 6.7% to Nepal's GDP and supporting over one million direct and indirect jobs (World Bank, 2022). With the number of visitors to Sagarmatha and the surrounding national parks continuing to increase, questions have been raised over the carrying capacity of Sagarmatha as a climbing and trekking destination (Huey et al., 2020; Ziegler et al., 2023). There have also been discussions around the sustainability of the industry and its reliance on local resident populations to facilitate safe access to the mountains (Adams, 1992; Baral et al., 2017; Birendra et al., 2021; Nepal, 2005, 2015; Panzeri et al., 2013; Wearing et al., 2007).

Risk has long been a recognised as both an unfortunate reality and in some cases a desired component of adventure tourism in environments such as Sagarmatha (Buckley, 2006; Musa et al., 2015; Swarbrooke, 2003; Wang et al., 2019). Physical risks intersect with psychological and emotional risks (Deb et al., 2023) and the mechanics of the adventure tourism experience are seen through the lens of tourist perceptions of opportunities for personal accomplishment, whilst stepping in the footsteps of 'revered' colonial pioneers and embracing the possibility of loss or even death (Janowski et al., 2021; Le, 2022; Mu & Nepal, 2016; Wolff et al.,



Observed transitions of the adaptive cycle:

- (1) → Growth → Increased interconnectedness → Rapid change & release → Renewal & reorganisation → [full adaptive cycle]
- (2) → Growth → Renewal & reorganisation → Growth →
- (3) → Growth → Increased interconnectedness → Growth →
- (4) → Growth → Rapid change & release → Renewal & reorganisation → Growth →
- (5) → Growth → Increased interconnectedness → Renewal & reorganisation → Growth →

Figure 1. Observed transitions between phases of adaptive cycle. Source: Adapted from Hall (2018).

2019). When tourists attempt to climb Sagarmatha they are exposed to a variety of hazards including 'the extreme effects of altitude on the body, high-winds and storms, and the objective hazard of the notorious Kumbu Icefall' (Wilson & Dashper, 2023, p. 2284). The Khumbu Icefall is located just above Sagarmatha base camp and can move between 0.9 metres to 1.2 metres per day, which leaves the region prone to avalanches caused by large seracs of ice breaking free and falling down the mountain (Dawson, 2022). Over 47 people

having died on the Khumbu Icefall since 1953 and avalanches occur on such a regular basis that regular climbers can become numb to their occurrence. In 2014, 'an ice chunk the size of a ten-story apartment building' gave way and 16 sherpas died (Narula, 2019). Such risks are often exacerbated by a lack of government regulation around visitor numbers and the relative remoteness of Sagarmatha, which can cause access issues for rescue teams when a disaster does occur (Ziegler et al., 2023). The risks associated with climbing Sagarmatha have

increased in recent years owing to the effects of climate change (see Miner et al., 2020; Watson & King, 2018).

Over the last decade, a number of strategies have been either proposed or implemented to manage the risks experienced by clients (tourists) and local support workers when attempting the climbing of Sagarmatha. One strategy, which is characteristic of an increasing number of tourism destinations after the COVID-19 pandemic is to use virtual reality technology to allow tourists from all over the world to experience the mountain without needing to physically access the site (Thapa, 2022; Wu et al., 2022). To help ensure the safety of those who continue to visit the site weather stations have been erected at the summit to provide more accurate updates on conditions (Wilkinson, 2019). Helicopters and drones were also permitted in 2024 to take climbers and their equipment in non-rescue situations to an altitude of 6400 m, thus taking climbers directly to camp 2 and avoiding the Khumbu Icefall entirely. This initiative, which was recently blocked by the Nepal Supreme Court (see News Wires, 2024), was instigated under pressure from climbing companies concerned with the late opening of the climbing routes due to bad weather. The use of helicopters and drones had the effect of increasing climber safety but also impacted on the natural serenity of the environment (Benavides, 2024). In June 2022, the Nepal tourism ministry also explored an option, which was later not implemented to move base camp, which currently sits just below the Khumbu icefall further down the mountain to avoid the effects of glacial creep and avalanches (Khadka, 2023). A number of climbing operations have also made the decision to avoid the dangers posed by the icefall altogether by moving their operations to the northern approaches to Sagarmatha in Tibet (Bashyal & Gowen, 2018).

Climbing operators have a duty of care to travellers which is regulated through policies laid down by the Nepal Tourism Board and other government departments under the Ministry of Culture, Tourism and Civil Aviation (Trekking Agencies Association of Nepal, 2023). The International Federation of Mountain Guides Association and the Nepal National Mountain Guide Association have developed training and certification programmes (International Federation of Mountain Guides Association, 2024; Nepal National Mountain Guide Association, 2024a), which an increasing number of individual workers are attaining (see individual profiles at Nepal National Mountain Guide Association, 2024b). Instruction is also offered to icefall doctors operating on the Khumbu Icefall in the form of one-day training session at the Khumbu Climbing Centre and a week-long training programme at

Sagarmatha Base Camp at the beginning of the climbing season (Arnette, 2024). However, while the climbing industry is now increasingly more professional than was the case prior to the establishment of the Manang Mountaineering School in 1979 or the instigation of climbing permits, which occurred at around the same time; for many climbing companies, the principal focus of their operations remains commercial and the provision of a quality experience for their paying customers and not the safety of local workers (Nepal & Chipeniuk, 2005).

Tourists are motivated to climb Sagarmatha for a range of personal reasons including a 'desire to physically, cognitively, emotionally, and spiritually feel different ways, including feeling strong, challenged, accomplished, and connected with the mountain' (Burke et al., 2010, p. 390). Every visitor will form a personal connection to the mountain (see examples from Lianne and Anna in Wilson, 2022) and the challenge for risk managers is to balance a traveller's well-paid desire for a Sagarmatha experience with the risks involved. When they do so, we recognise that both the selection of camp sites and the use of high-altitude local workers are designed to manage but not eliminate the risk faced by climbers. Whether one is referring to the Khumbu icefall, the Cornice Traverse or the Hillary Step there is a recognition amongst experienced climbers of the inherent risks in climbing the world's highest mountain. This is particularly noticeable when moving into the 'death zone' (the area above 8000 m above sea level) and a person is out of the reach of conventional rescue teams, with the only aid being other climbers (Nyaupane, 2015; Wengel, 2019).

Risk imposition on the 'Edge of Chaos'

Ziegler et al. (2023) called for risk management in the Himalayas to be underpinned by systems thinking and a recognition of the complex interplay of voices involved in the different parts of the conventional disaster management cycle (i.e. preparedness, mitigation, response, recovery). Panarchy theory is premised on the notion that a system such as Sagarmatha is made up of a number of embedded natural and human cycles or adaptive processes (Dorren & Berger, 2006) that are hierarchically and 'dynamically organised and structured across scales of space and time' (Allen et al., 2014, p. 578). Figure 2 is a panarchical representation of the various adaptive systems within the Sagarmatha high-altitude trekking system. Here we can see the agency of individual climbers being embedded within the context of the actions of adventure tourism operations, the Sherpa community and the risk management

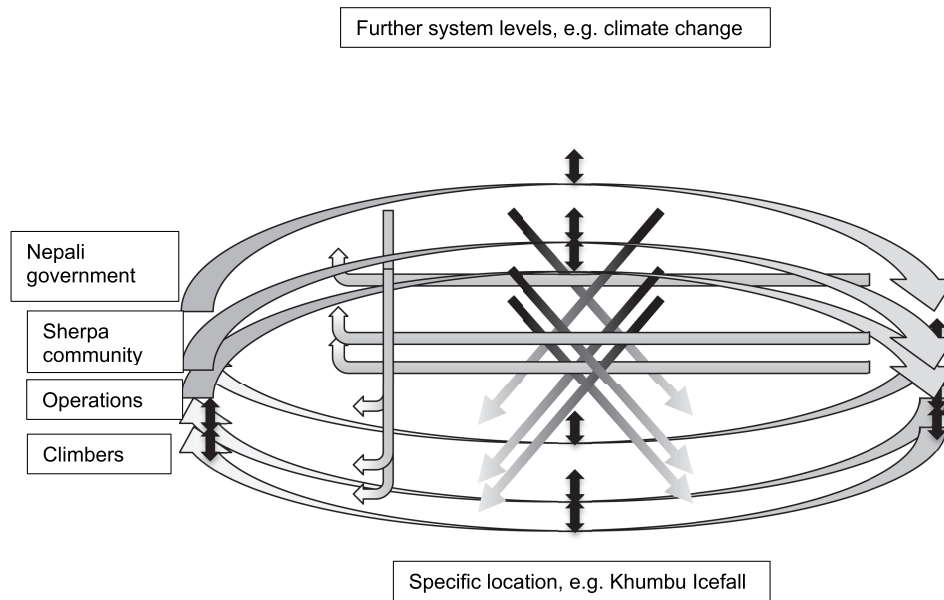


Figure 2. Panarchical arrangement of adaptive systems in the Sagarmatha tourism system. Source: Derived from Hall et al. (2024) and Hall (2018).

strategies of the Nepali Government (specifically the Ministry of Culture, Tourism and Civil Aviation). These higher-level stakeholders are in-turn situated in wider natural climatic processes.

Each level of stakeholder in Figure 2 has the potential within a panarchical arrangement to influence the actions of other stakeholders. For example, following the death of 16 high-altitude workers during the aforementioned 2014 avalanche, local sherpas campaigned to secure a raise in their life insurance cover from \$4000 USD to \$15,000 USD from the Nepali Government (Sharma, 2014). Similarly, following the death of 22 climbers in 2019, the Nepali Government made the decision to limit the number of climbing permits (News Wires, 2024). However, what right do individual climbers have to impose different levels of risk on sherpas and other high-altitude workers? Panarchy theory stipulates that:

During the re-organisation at a given scale, conservative structures at larger scales provide a form of memory that encourages reorganization around the same structures and processes rather than a different set (that is, rather than a new regime). Similarly, during the Ω phase at a given scale, “destructive” processes can affect larger scales (sometimes termed “revolt”) (Allen et al., 2014, p. 580)

In the immediate aftermath of the 2014 avalanche Sagarmatha disaster, the decision was made by Sherpas to abandon the rest of the climbing season. This decision was supported by some climbers at the time but others described the decision as being akin to being ‘held captive by terrorists’ (Crawford, 2016).

And, while sherpas understand the risks involved in summiting the mountain, the fact that the summiting of Sagarmatha is a voluntary activity leads to an important question regarding the right of the tourism industry to continue to impose demands on sherpas – to adapt to a crisis event by returning to the mountain to try again that they are not expected to shoulder themselves. Song (2019) reasoned that it is okay to impose high levels of risk on other people, so long as three principles (conditions) are satisfied:

1. Consent Principle: It is permissible to impose a high level of risk on someone if he or she consents to that risk based on reasonable expectations, provided that the information received about that risk is fully disclosed and no deception is involved.
2. Prevent Disaster Principle: It is permissible for someone to impose a high risk of harm on others if doing so can prevent disaster.
3. Reciprocity Principle: It is permissible for someone to impose a high risk of harm on others if others are also allowed to impose the same risk of harm on that person.

(Song, 2019, pp. 769, 771 & 772)

If we examine the core components of the consent principle it is possible to argue that sherpas and other high-altitude workers should be encouraged to expose themselves to the dangers of the Khumbu icefall in order to facilitate the continued growth of climbing.

After all, sherpas represent collectively some of the most experienced high-altitude climbers in the world (Nestler, 2023). Their fame as ‘tigers of the snow’ (Adams, 1996), which can be derived by their work in the climbing industry over many decades has led to foreign climbers describing sherpas as people who have done and can do it all (Mu & Nepal, 2016). However, even if workers possess sufficient levels of epistemic understanding to understand the immediate risks they face on the mountain, the question needs to be asked as to whether the unequal power relationships that exist between the climbing industry and the sherpas they employ (Miller & Mair, 2020) impinges on a sherpa’s ability to give informed consent?

Each year icefall doctors on the Khumbu Icefall receive \$2500 to \$3000 for the 24 hours they spend on-call fixing ropes, aiding climbing teams and assembling/ disassembling ropes and ladders from the icefall at the end of the season. Further up the mountain, the Expedition Operators Association has been said to award the contract to fix ropes to the lowest bidder from amongst the competing climbing companies (Benavides, 2023). Do participating climbers have the ability to refuse a contract under these conditions when their involvement in the climbing industry is directly connected to raising money to support struggling families and communities? Increasingly, one would suggest that they do. In the period just after the 2014 avalanche some sherpas did indeed refuse to continue climbing; a group that was described as ‘militants’ who were going against the wishes of the Ministry of Culture, Tourism and Civil Aviation, and many other sherpas and foreign climbers (Horrell, 2021). In recent years many sherpas have discouraged their children from entering the profession owing to lack of government support, the risk to their lives and the availability of alternative lines of employment (Karki & Kafle, 2020). Waldrop (1993) notes that rigid hierarchies including historically some nation states and private corporations often find themselves locked into certain behaviours and trajectories that can make it difficult to them to respond to change. From an economic perspective the climbing industry needs sherpas as much as the sherpas need the climbing industry. For this reason, what is needed is a bottom-up/ self-organising strategy where the evolution of the chaotic system to a more stable condition is driven by local stakeholders with the aim of ensuring the ongoing sustainable stability of the system. The only way for this to be achieved, however, is for sherpas to decide on the merits of their employment along with an understanding of the alternatives available and for those who continue to climb to be appropriately financially compensated.

The second principle (or condition) that could conceivably justify the imposition of a high degree of risk on an individual is the idea that in doing so it could prevent a disaster (Song, 2019). Ever since the fated Mallory expedition to the summit of Sagarmatha in 1922 there have been numerous cases of treks that are typically described as a ‘disaster’ where extreme cold, falls, avalanches and earthquakes can cause death (Ithal, 2022). Although not all disasters could have been avoided by the presence of high-altitude workers, the realities of the Khumbu Icefall including the randomness of the timing of avalanches and the need to keep moving as much as possible means that the presence of local workers is fundamental to the success of a climb. However, does the possibility of protecting oneself from disaster justify exposing another person to the same risk, including forcing local workers to stay on the Khumbu Icefall for longer than they otherwise would to aid inexperienced clients (see Wilson & Dashper, 2023)?

The idea that tourists would seek to expose others to risk and that ‘the other’ should simply accept it, is not an idea that is limited to adventure tourism. Dillard et al. (2000 in Urry & Larsen, 2011, p. 82) observed that throughout the tourism industry, marginalised workers such as those in sex tourism and the broader hospitality sector enter into an implicit pact where they ‘will treat the latter [i.e. tourists] in a dignified fashion and as an acceptable person; anything else would be morally wrong’. Urry and Larsen (2011) note that such workers are reliant on travellers for their livelihood and that not providing an acceptable service would be costly. However, the responsibility also lies with the traveller and specifically their thoughts regarding how to process their emotive drive to summit Sagarmatha against the risks posed to sherpas and themselves. When doing so, travellers must consider whether their situation, which involves voluntarily exposing themselves to harm actually qualifies as a disaster and whether they can therefore justify placing risks on others, many of whom would not otherwise be there. Many climbers would argue that they can, given that the risks experienced by local workers are just the reality of their employment in high-altitude climbing (Mu & Nepal, 2016). However, the only way that a system operating on the ‘edge of chaos’ can re-organise itself is for those actors within it to appreciate those elements of the system that provide the opportunity to adapt and innovate to produce a more stable form.

The third principle (or condition) relates to the idea that when there is a community of people experiencing a risk, e.g. in group adventure travel, risks can be justified against one person, so long as there is due care afforded

by all parties, there is an equality in the risk imposed, the subsequent risks are neither too extreme or if a social benefit is achieved through their imposition. Song (2019) has identified challenges with such a situation, which this paper argues are relevant to climbing on Sagarmatha. Firstly, while climbers and local workers are exposed to risks on the mountain, it is difficult to determine a situation where the risks imposed on different stakeholders are equal. Yes, workers are required to traverse the Khumbu icefall on a more regular basis than tourists. On the other hand, however, tourists often have far less experience than local workers meaning that each trip is inherently riskier. It is therefore difficult to identify a community of risk takers and without such a community, how would it be justifiable for one party to expose another to risk, when the conditions of that risk are not equal? Secondly, one would have to consider whether the reciprocal imposition of a risk back on another person would lead to either a wider social benefit or whether it can be justifiable on the basis of the risk being negligible. The deaths that have been recorded on the Khumbu icefall and elsewhere on Sagarmatha are evidence of the fact that the risks are not negligible – during the process of editing in response to reviewer feedback on an earlier draft of this paper two climbers died near the summit of Sagarmatha when a cornice collapsed (Ayres, 2024). But what about a social benefit?

To illustrate this point Song (2019) describes a situation of two person Russian Roulette where ‘in order to make the game more thrilling, they decide to shoot each other at the same time’ (p. 773). This situation is certainly akin to the decision of a high-altitude worker to assist an inexperienced trekker navigate a part of the Khumbu icefall. Song (2019) argues that there ‘is no significantly greater social benefit (i.e. disaster to avoid) in playing Russian roulette that can outweigh the burden of bearing a high risk of death; thus, even if reciprocity is at play, reciprocity seems to be insufficient to justify the game’ (p. 773). When applied to the navigating the Khumbu icefall and the wider Sagarmatha environment, we must consider what is it in achieving our goals as tourists that justifies the potential for death amongst the members of our climbing party?

Conclusions

This paper has explored at a conceptual level the risk relationship between the climbing industry, local workers, and tourists on Sagarmatha. Tourism destinations are increasingly recognised for the complexity of their place-based setting and the need to actively engage diverse local stakeholder groups in sustainable tourism planning and development. However, while

high-altitude workers have long been recognised as essential participants in the creation of the Sagarmatha climbing experience, operators continue to pursue traditional consumer-oriented linear conceptualizations of risk where hazards are assessed on the basis of their probability and impact (Ale, 2009).

This paper has argued that to truly conceptualise risk we also need to acknowledge the complex relationships between different tourism stakeholder groups in a tourism environment such as Sagarmatha. With reference to adaptancy theory and panarchy we have explored how different stakeholders react to change, as well as suggesting that in the future more attention needs to be given to the ethics of risk imposition of one stakeholder group on another. Opportunities exist to take the theoretical ideas explored in this paper and apply them empirically to the Sagarmatha case. This could include mapping historical and current cases against the adaptancy transitions outlined in Figure 1. Further work is also needed to understand the various stakeholder interactions that characterise the panarchy model. It is important that the tourism industry considers carefully how we can adapt to change in a manner that is reflective of the different experiences of people on the mountain. For example, as climbers consider the safety of traversing the Khumbu Icefall, following in the ‘footsteps of legendary mountaineers while climbing a marvellous labyrinth of ice towers, crevasses and ladders’ (Mountain Madness, 2024); spare a thought for the icefall doctors who have gone before you:

Their syringes are ropes, their plasters aluminium ladders. Year after year, the so-called Icefall Doctors ‘doctor’ the ascent route through the dangerous Khumbu Icefall, the passage on the way to the summit of Mount Everest with the greatest objective dangers. With their ladders they bridge deep crevasses, with the fixed ropes they secure the route – and then maintain it throughout the season until the end of May. It’s extremely dangerous work, as the icefall is constantly moving and one of the mighty ice towers can collapse at any time (Nestler, 2023)

Disclosure statement

No potential conflict of interest was reported by the author(s).

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