CHAPTER 3

Community Tourism Resilience: Some Applications of the Scale, Change and Resilience (SCR) Model

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3.1 DEFINING RESILIENCE

In western Philosophy, Heraclitus (c.535 - 475 BCE) is credited with the idea that change is the only constant in the universe. However, it is in eastern philosophy where the changing nature of all phenomena reached its highest understanding. Thus, for Gautama Buddha (c.563 - c.483 BCE) impermanence was considered one of the three essential and defining characteristics of all sentient existence. Humans, however, are notorious for clinging to at least a sense of permanence, as seen in our obsessions with nostalgia, memorabilia and heritage. Lowenthal (2015) makes a compelling argument that all our fuss over the preservation of authentic heritage and history says more about who we are in the present (what our present values are), rather than any true reflection of what might have existed in the past. This is because we can never know or regain the past, no matter how hard we try. We live in a world that is always changing, evolving and becoming new. The dichotomy and conflict between the past and present is the same that exists between permanence and impermanence, between stability and change. These are essential tensions that define human experience, along with the political discourses that define how communities develop and the role of tourism and tourists in that development process.

We have suggested elsewhere that this same tension underlies the distinction between a sustainability approach and a resilience approach to community development (Lew et al 2016 REF). Both sustainability and resilience are about dealing with change. Sustainability’s approach to change is essentially based on conservation (or in some instances, restoration), whereas the resilience approach is about adaptation and transformation. However, because everything changes, even sustainable development approaches are aware of the futility of clinging to the
notion of permanence, which is one reason why it is sometimes equated with resilience (e.g., Levin, et al. 1999; Adger 2003; Edwards 2009; Farrell & Twining-Ward 2005; Fiksel 2006). For example, two of the leading authors in resilience thinking, Holling and Walker (2003:1), once stated that “[a] resilient socio-ecological system is synonymous with a region that is ecologically, economically, and socially sustainable”. Elsewhere, however, Walker suggested that sustainability is one part of the broader context of system resilience (Anderies, Folke, Walker, & Ostrom 2013).

The concept of resilience has numerous interpretations, representing different disciplinary perspectives (Brand & Jax, 2007), but usually refers to a specific model of how social-ecological systems (SES) respond to disturbances. One approach within this model identifies resilience as one of three related attributes that shape a SES response to stress, the others being adaptability and transformability (Walker, Holling, Carpenter & Kinzig, 2004). Here, resilience is the conservative element, maintaining coherence through its resistance to change, and latitude (or flexibility) for change. Resilience is measured by the degree to which essential functions are perceived to remain unchanged through a disturbance. Adaptability is related to latitude in that it is the degree to which a system can intentionally reorganize itself to manage a disturbance before forcing a collapse of the existing system. In an SES, this is accomplished through humans acting either individually or in groups. Transformability is the ability of an SES to create a new system when the old one is forced past a threshold and collapses.

The outline above (resilience, adaptability and transformability) is typical of the “ecological resilience” approach to resilience thinking, which tends to be the dominant theoretical perspective in the current literature. In addition to ecological resilience, two other approaches that are often identified are “engineering resilience” (Holling 1996), which focuses on the efficient return to a previous state following a disaster event, and “evolutionary resilience”, which rejects the idea of functional stability and fully embraces the idea of persistent change and impermanence (Simmie & Martin 2010; Davoudi 2012).

These ideas have a long, but narrow lineage in tourism studies. Chaos theory was suggested by some scholars in the 1990s as providing a more realistic approach to the complexity of tourism and the world in which it is situated (Faulkner & Russell, 1997; McKercher, 1999). These discussions occurred at the same time that contemporary resilience theory was still in its formative stages. In the 2000s, several authors began to apply resilience theory concepts to tourism contexts (Farrell & Twining-Ward, 2004, 2005; Petrosillo, Zurilini, Grato & Zaccarelli, 2006; Tyrrell & Johnson, 2007; Strickland-Munro, Allison & Moore, 2010). However, at that time, resilience was not yet widely picked up in the field of tourism, possibly because it was more closely associated with the natural sciences than with business studies, which tends to dominate tourism research.
Since the later 2000s, a growing realization of the limits of sustainability, coupled with an increasing awareness of the constancy of social and environmental change, especially global warming, has given rise to an explosion of scholarly work in the area of resilience theory and resilience thinking, the former being more structured, while the latter is more general (Strunz, 2012; Lew, 2014; Meerow & Newell, 2015). Tourism research that takes a resilience thinking approach has also gradually increased, although tending to focus more on tourism as an economic activity (Hamzah & Hampton, 2012; Coles et al., 2013; Hopkins & Maclean, 2013; Biggs, 2015; Orchiston, 2015; Kaenzig, et al., 2016), rather than the larger context of tourism as a subsystem within the broader systems of place, region and the world (Hopkins & Becken, 2014). The concepts developed below are intended to encourage deeper understanding and wider adoption of the still poorly understood concept of tourism resilience.

3.2 SPATIAL AND TEMPORAL SCALES

A basic premise of all resilience thinking is that change occurs at different spatial scales and at different temporal scales (Carpenter et al. 2001). Spatial scale refers to the location of a specific system or subsystem within a nested hierarchy of larger and smaller systems. A community, for example, could be considered a political subsystem that is nested within a larger county or provincial system. The community itself would contain multiple smaller subsystems, including retail and residential systems, educational systems, and transportation and utility systems. A community tourism system could be modeled as consisting of a tourism services subsystem (accommodation, restaurants and travel services), a tourist attraction subsystem (commercial and non-commercial attractions), a tourism marketing subsystem (promotional and social media), a tourist market subsystem (tourists and the places they come from), and a tourism governance subsystem (policies and regulations impacting tourism development).

Temporal scale typically refers to the rate at which change takes place. Change can accumulate in small increments separated by short periods of time (slow change), or in a big and sudden event that in most instances occurs only once in a long period of time (fast change). As with spatial scale, a time period is short or long based the context of the system of focus, such as a community or an individual business. The type of event can also be significant. For example, the negative impacts of many major human or nature-related disasters on tourist arrivals can vary considerable, but are generally significant only over a short term (up to two or three years), but are often insignificant when taking a generational perspective (20 to 30 years), especially when many other changes are also taking place. Marketing efforts can make a recovery even shorter (Mao et al., 2010).
Lew (2014) proposed a model to enable a better understanding of the different ways that resilience is defined and practiced, based on the spatial (or social) scale of the impacted system and the temporal scale (slow/incremental/small impact and fast/sudden/large impact) of the driver of change (Figure 3.1). While the initial focus of the model was on community level tourism systems, here we are extending the discussion of this scale, change and resilience (SCR) model to apply to almost any two-level system hierarchy.

![Diagram showing the scale, change and resilience (SCR) model of system response to disturbance and change. Source: Lew, Ng, Wu & Ni, 2016; based on Lew, 2014.]

The model postulates four general forms of resilience, each of which is separated by a threshold related either to its location within the system hierarchy or to the speed and magnitude of change, causing a qualitatively and quantitatively different response. The characteristics of these four...
forms of resilience are summarized in Table 3.1, with a focus on tourism related examples. It is important to note that change drivers that impact higher levels in the hierarchy will cascade those impacts to lower levels. A regional economic crisis, for example, can have impacts on spatial systems ranging from the national to the provincial, and from an entire city to an individual tourism business (Hillmer-Pegram, 2012). Cross-scale impacts like this can move in all directions across the SCR model, both within and across spatial and temporal scales.

3.3 RESILIENCE AND SUSTAINABILITY

The scale, change and resilience (SCR) model in Figure 3.1 indicates that the issues inherent to each of the generalized cells have both resilience and sustainability implications. Change is often considered as both a problem to be mitigated or managed and an opportunity for innovation and new beginnings. Defining sustainability as conservation and restoration, and resilience as adaptation and innovation provides space for both of these paradigms to be employed in a logical manner to address the challenges of change that a business or community face. The policy question then becomes: What do we want to conserve or keep (sustainability) and what do we want to change or abandon (resilience)?

“What to keep and what to change” is not a new question. “How to keep them and how to change them” is also not new. They are fundamental questions of public policy and politics, with significant implications for power relationships and social equity impacts among different interest groups in a community (Joseph, 2013; Weischelgartner & Kelman 2014). Sustainable development has been the dominant approach to answering these questions, with neoliberal economic thinking being its antagonist in policy debates. Some suggest that resilience thinking is another tool for a neoliberal agenda because it reduces the role of the central government and puts responsibility for adapting to the forces of global power on the backs of local communities and individuals (Porter & Davoudi 2012; Welsh 2014). In many instances, it is the poor who suffer the most from climate adaptation measures (Anguelovski et al. 2016). This, however, is based on a narrow interpretation of resilience (Brand & Jax, 2007).

By putting resilience on an equal footing with sustainability, the two concepts help to make clearer the policy and action choices that communities face, and thereby enable them to make better choices for their future. For some issues, sustainability will be the clear preference of the community while resilience may be preferred for other issues. The answer also might be something in the middle – incorporating elements of both sustainability and resilience. Understanding what is a sustainability (mitigation) choice and what is a resilience (adaptation) choice, and what are the theoretical underpinnings of each of these choices, can offer new insights into the policy formation and decision making process.
Table 3.1. Characteristics of the scale, change and resilience (SCR) model, with tourism subsystem examples.

<table>
<thead>
<tr>
<th>Cell 1: Slow change impacting a distinct sectors (subsystems) of the community</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tourism scale elements</strong></td>
</tr>
<tr>
<td>(a) individual and independent tourism businesses are at the smaller level spatial scale, perhaps with street vendors being the smallest</td>
</tr>
<tr>
<td>(b) the overall tourism economic sector is at the largest spatial scale within this cell</td>
</tr>
<tr>
<td><strong>Primary drivers of change</strong></td>
</tr>
<tr>
<td>(a) the persistent entropic decay of facilities (buildings and infrastructure) is probably the slowest changing element (on the left of the change continuum)</td>
</tr>
<tr>
<td>(b) the changing expectations and demands of clients and the marketplace, which can sometimes change quickly (to the right of the change continuum in cell 1)</td>
</tr>
<tr>
<td>(c) social and environmental disruptions impacting the larger or higher system that the subsystem is embedded within</td>
</tr>
<tr>
<td><strong>Management Resilience and Sustainability responses</strong></td>
</tr>
<tr>
<td>(a) a facilities maintenance program and periodic refurbishing and renovations</td>
</tr>
<tr>
<td>(b) client feedback and market awareness to revitalize or abandon old services and introduce new ones</td>
</tr>
<tr>
<td>(c) working cooperatively to address larger system disruptions</td>
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<table>
<thead>
<tr>
<th>Cell 2: Slow change impacting the entire community (system)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tourism scale elements</strong></td>
</tr>
<tr>
<td>(a) the shared (public) community resources upon which the tourism sector depends, including cultural traditions, natural features, public open space, transportation and other basic infrastructure, resident hospitality toward visitors, and good governance</td>
</tr>
<tr>
<td>(b) some of these resources may be managed at smaller neighborhood levels, while others may be managed at larger regional levels (such as regional or national transportation systems)</td>
</tr>
<tr>
<td><strong>Primary drivers of change</strong></td>
</tr>
<tr>
<td>(a) social and economic globalization threatening cultural traditions, landscapes and values</td>
</tr>
<tr>
<td>(b) climate change and resource exploitation affecting natural resources and environments</td>
</tr>
<tr>
<td><strong>Resource Resilience and Sustainability responses</strong></td>
</tr>
<tr>
<td>(a) the conservation and protection of cultural and environmental resources against decline</td>
</tr>
<tr>
<td>(b) their restoration or revitalization to a desired previous state</td>
</tr>
</tbody>
</table>
**Cell 3:** Fast change impacting distinct sectors (subsystems) of the community

<table>
<thead>
<tr>
<th>Tourism scale elements</th>
<th>same as for cell 1, above</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary drivers of change</strong></td>
<td>unforeseeable disaster events that cause the potential (pre-event) or actual (post event) loss of (a) facilities, (b) attractions, (c) markets or clients, or (d) skilled employees, as well as almost any broader disasters that impact the larger system that the subsystem is part of</td>
</tr>
<tr>
<td><strong>Planning Resilience and Sustainability responses</strong></td>
<td></td>
</tr>
<tr>
<td><em>Pre-event:</em> (a) strategic planning for the marketing of a facility in response to a major market disruption may occur toward the left of the change continuum in cell 3; (b) disaster recovery planning (DRP) for business continuity following a disruption; (c) preparation and mitigation of long term climate change through greening of business practice; (d) diversification of business activities and service offerings</td>
<td></td>
</tr>
<tr>
<td><em>Post-event:</em> (e) rebuild of facilities; (f) marketing to reclaim clientele; (d) new services to meet client needs; (e) taking advantage of broader recovery support from the system that they are a part of</td>
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</tbody>
</table>

**Cell 4:** Fast change impacting the entire community (system)

<table>
<thead>
<tr>
<th>Tourism scale elements</th>
<th>same as for cell 2, above</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Primary drivers of change</strong></td>
<td>major disaster events which have potential (pre-event) or actual (post event) impacts on the well-being, livelihood and support infrastructure of the entire community</td>
</tr>
<tr>
<td><strong>Governance Resilience and Sustainability responses</strong></td>
<td></td>
</tr>
<tr>
<td><em>Pre-event:</em> (a) adopting a disaster preparedness plan; (b) training emergency personnel in disaster preparedness; (c) adopting a disaster recovery plan; (d) public education in disaster preparedness and recover; (e) reducing known vulnerabilities, such as infrastructure hardening and redundancy (duplication) to build engineering resilience</td>
<td></td>
</tr>
<tr>
<td><em>Post-event:</em> (f) providing emergency assistance to those in need; (g) repairing damaged support infrastructure; (h) retraining of employees or residents; (i) providing public information on current conditions; (h) public involvement in longer term recovery implementation</td>
<td></td>
</tr>
</tbody>
</table>

Source: Lew, Ng, Wu & Ni, 2016.
3.3.1 A Taiwan Example

A comparison of well-known rural tourism communities in Taiwan that have experienced major natural disasters with those that have not experienced such disasters is informative of this sustainability and resilience approach to community development (Lew, et al, 2017). The research discussed here examined indicators of sustainability and resilience in three small communities (populations about 1000) that had suffered severe damage from the 921 (September 21) Earthquake in 1999 and Typhoon Morakot in 2008, comparing them to three comparable villages that had not had such an experience. The results found that the disasters were a defining experience in the first three communities – something that residents pointed to as changing the direction of their communities.

A significant finding was that disaster-experience communities had secured four to five times more government development funds than non-disaster communities. This appears to be a result of the institutional learning skills in grant writing that they had developed immediately after the disaster event. The central government provided them with 20 months of special recovery funding, which was further facilitated by NGO-type groups that were drawn to the communities to support their recovery. (All six communities have no long-term permanent sources of funding, relying instead on the success of annual grant applications made to specific county and central government level programs.) The disaster-experience communities also had higher rates of formal public education programs (agricultural, environmental, and disaster preparation) although their basic knowledge and use of traditional environmental resources were the same as in non-disaster communities.

Although all six of the communities had a substantial tourism orientation in their local economy, it was especially active in the disaster-experience communities, where collaboration rates were higher and the adoption of innovative new products were more likely to emerge from within the community. Non-disaster communities, not having had experienced a major disruptive event, tended to be more conservative in their outlook on product innovation and were less collaborative with one another. These differences are supported by resilience theory, which suggests that a crisis or disaster can break locked-in development paths, which can then create opportunities for not only a bounce-back from the impacts, but a bounce-forward to a better condition (Solnit, 2009; Martin, 2012; Neurmayer et al., 2014). Tourism, interestingly, was one of the development paths that benefitted the most in this bounce-forward, apparently because it offered opportunities for a shared collaborative vision and product innovation. This same phenomenon was also found in other research on disaster tourism communities in Taiwan (Tsai et al., 2016).

What the disaster event experience created for the three communities studied was a resilience-led approach to community development. What the lack of a disaster resulted in for the non-disaster
communities was a sustainability-led approach to community development (Lew, et al 2017). The disaster experience, combined with the nature of the post-disaster recovery programs that were funded by the central government, created an attitude and approach that was more in line with resilience thinking (adaptation to change). The non-disaster communities are able to apply for the same funding programs that are available to all rural communities, which tend to be dominated by environmental and cultural sustainability initiatives in Taiwan. As a result, their development is dominated by sustainability activities, such as the conservation of natural habitats and the collection of oral histories from community elders.

There are some central government programs that fund economic restructuring for rural areas, including both disaster and non-disaster communities, which would be considered resilience oriented, based on our definitions. A major example is the Leisure Agricultural Area program, which transitions farm areas into tourism and recreation destinations for urban residents, thereby creating much needed diversification for Taiwan’s rural economy. In addition, disaster-experience communities also have access to the sustainability funds to improve their environmental and cultural resources. The ideal scenario, from this example, is for a community to be strong in both sustainability and resilience. Currently, this ideal was most evident in the disaster-experience communities studied. How to instill a greater resilience orientation in non-disaster experience communities is a major question for community planning and development today.

3.4 BEFORE AND AFTER EVENTS

How a business or community responds to the threat of a fast change event before it happens and after it happens is significantly different (Table 3.1). This reflects the perspective of taking either a proactive approach to the challenges faced, or a retroactive or reactive response. At the slow end of the change continuum in Figure 1, it is usually easy to predict when a change will happen based on the product life expectancy of construction materials and furnishings. These changes are often considered no more than a ‘nuisance’ or irritation that must be tended to on a regular basis. Changes in consumer preferences are somewhat more difficult, although they often occur over longer periods of time, allowing for informed and astute observers to adjust.

Figure 3.2 summarizes possible tourism responses to change events based on the spatial hierarchy and change continuum in the SCR model. Moving up the change rate continuum results in events and processes that are harder to predict and costlier to respond to. When they happen unexpectedly, they can reach a ‘crisis’ stage or, in an extreme event, they could be labeled as a ‘disaster’ (at the far right of the continuum). Distinctions between a nuisance, a disturbance, a crisis and a disaster are judgement calls, although they usually reflect the magnitude of impact on the system or subsystem.
Smaller subsystem entities, at the lower end of the spatial scale, are more narrowly focused on their business survival. Complete abandonment of a tourism activity, such as an accommodation, restaurant or even an attraction, is more likely to occur at the smallest subsystem level, where worker mobility is greatest. Higher system level entities often involve greater financial, political and emotional investments by the community and, therefore, are much more difficult to raze or abandon. In the example of rural Taiwan, it is likely that the small spatial scale of the rural communities studied made them more flexible (transformable) than would be the case for larger urban settlements. This could be an explanation for the very pronounced difference encountered.
between the disaster- and non-disaster communities. When a loss is experienced, these subsystem entities can abandon portions of the past with less impact on wider system processes.

Throughout the entire spectrum of spatial scale and rates of change, a proscriptive approach will prepare a system (community) or subsystem (sector) much better for both expected or unexpected changes. For example, much has been written about how communities and the tourism sector can plan for major crises and disasters (e.g., Dorge, 2000; Richie, 2009; Masterson et al., 2014), as well as about facilities management and the marketing of tourism entities, from independent private businesses to public national parks. Understanding how these different entities relate to one another across spatial and temporal scales, however, is much less understood, especially in a social system context.

### 3.4.1 Bistability Considerations

In resilience theory, slow change variables (such as climate) are also known as “controlling variables” because they have a greater propensity to remain stable over the long term, whereas fast change variables (such as weather) are more susceptible to instability. In social systems, culture values are often considered a slow change variable, while popular styles and fads are considered fast change variables (Holling 2001). To simplify our understanding of this, Walker et al. (2012) describe a “bistability” model, in which a system has the potential to exist at two levels (or states) of stability, one dominated by a fast variable and the other dominated by the slow, controlling variable. As pressure from an external driver of change increases, the stress weakens the fast changing variable to a threshold point where it collapses and the underlying slow change variables become dominant. Recovery of the fast change variable (which may be more desired by humans than the slow change variable) might be possible, but only with a dramatic change in conditions in the external driver of change.

An example of this bistability model is a coral reef system, which is highly desired by humans, and highly complex and sensitive to changing seawater conditions. As ocean temperatures rise, the health of the coral system gradually decreases, until a threshold is reached where coral bleaching occurs across the entire reef system, which is then replaced by a less desirable algae dominated system. The algae system had always been there, but was previously dominated by the coral reef system. Because the algae system is more resilient to ocean warming, it become the new state of stability. The preferred coral reef system could, in theory, return, but its recovery would be much more difficult and lengthy than was its collapse.

This same idea can be applied metaphorically to human social systems. There are many examples around the world of community that have become popular tourist attractions based on having distinct architectural and cultural resources. This scenario is especially true of minority ethnic communities. Because they are distinct from the dominant social order, they are also
sensitive to acculturation and other external impacts. The motivation of tourists to visit them in increasing numbers becomes an external driver of change. In this case, the fast change variable is the sense of place that is experienced in a non-commodified traditional setting that is dominated by local residents who share a distinct culture. The slow change variable is the built environment and economic system that contains this sense of place, but also contributes to it.

As the number of tourists increase, the fast (or “easily”) changing variable is transformed due to commodification and presence of larger numbers of non-locals. This is a mixed bag, in which tourism revenues may be highly desired by the community, but the impacts of tourism on the local sense of place might be undesired. If the driver of change is not effectively managed, a threshold could be reached in which there is a near complete loss of the traditional sense of place and of non-commodified culture practices, accompanied by a possible out-migration of residents who were born there. The community, in essence, becomes a tourist theme park (Rossi, 2016; Thomson, 2016). In this way it shifts from high level regime (traditional sense of place) to a lower level one which might be comprised of only the outward trappings (such as building facades and costumes) of a culture that no longer exists. Ultimately, if the built environment is also lacking in cultural quality, both the locals and the tourists could abandon the destination altogether, leaving only the shell of a community in their wake.

On the other hand, as the external driver increases and its impacts become more pronounced, it is more likely that the system or subsystem will take action to manage the situation. In resilience theory, the system response or changes taking place in response to the external driver is known as “feedback”. Feedback can be monitored as in, for example, the Limits to Acceptable Change (LAC) management process (Farrell & Twining-Ward, 2004). If proper feedback indicators are selected and actions taken to control the external driver of change or to reduce internal vulnerabilities, then it might be possible to avoid a threshold situation of doing too little too late.

The study of rural communities in Taiwan indicates that the disaster effect requires a certain threshold event – one that causes widespread damage with significant impacts that are felt across the community. In general, however, human societies tend to prefer to avoid the chaos that usually accompanies catastrophic events (whether an earthquake or the Disneyfication of a place), but can still learn from them when they occur.

3.4.2 Speed and Magnitude

Resilience theory identifies processes that occur frequently, but with low magnitude and those that happen infrequently but with higher magnitude (Walker et al., 2012). Both are sometimes considered versions of slow processes, although these concepts have not been as well developed as other areas of the theory. To simplify the complexity of community resilience responses, the SCR model (Figure 3.1) combines frequency and magnitude in the “change continuum” axis.
Slow change includes events that are small in magnitude, common in occurrence and incremental in frequency, whereas fast change events are considered large in their impact and rare or erratic in their occurrence.

Separating frequency and magnitude adds a new level to the SCR model, which may prove insightful for some management scenarios (Figure 3.3). The SCR2 model identifies eight cells that are separated by three thresholds. On the spatial hierarchy scale, the threshold distinguishes a subsystem level entity and the larger system level that are the same as those identified in the SCR model in Figure 3.1. On the frequency scale, a threshold lies between frequently recurring or ongoing changes and those that are more sporadic and sometimes unpredictable in nature. The third threshold is between more mundane changes that have only small impacts and major crises and disasters changes that can be transformative.

Figure 3-3. Scale, change and resilience model showing magnitude and frequency (SCR2).
Source: Lew, Ng, Wu & Ni, 2016.
Although seemingly straightforward, system boundaries as defined by these thresholds can often be difficult to distinguish and usually change as the focus of interest changes. Within the small communities in the rural Taiwan study, community leaders often occupy both system-level and subsystem-level positions at the same time, and may switch between these roles within the course of a single conversation. In some instances, the goals and initiatives of the community are indistinguishable from the goals of the individual business, government agency, or non-governmental or non-profit organization. The human mind is very flexible and can work at multiple spatial scales, as well as an envisioned future and an imagined past, to shape the present context.

Similarly, what may seem like a crisis or disaster to one person, such as the forced closing of a restaurant or a bed-and-breakfast, may be a relatively minor disturbance to someone else who was ready for a change of career anyway. The four-part SCR and eight-part SCR2 provide logically discrete categories for understanding the multifaceted nature of how communities respond to change. However, any such assessment must bear in mind the fluidity of human intentions, behaviors and effects.

The application of the SCR2 model can be approached by examining the tourism elements, drivers of change and resilience and sustainability options for each of the eight cells, as is shown in Table 3.1 for the SCR model. For simplicity, however, this discussion will focus on the four drivers of change listed in Figure 3.3.

a. **Persistent Change Drivers** (cells 1 and 2) – are high frequency and incremental pressures for change that are usually of low magnitude (impact) and which are mostly anticipated and therefore manageable if sufficient resources are planned for (see additional descriptions in Table 3.1). These are the often mundane drivers that the tourism sector (facilities and services) and the community (cultural and natural resources) need to effectively manage to provide quality tourism products that can be enjoyed by both locals and visitors, alike.

b. **Event Change Drivers** (cells 3 and 4) – are infrequent and often unanticipated occurrences that are usually manageable with some effort and cost; both levels of the spatial hierarchy may secure some form of insurance to protect themselves from these events. This could be the temporary loss of infrastructure services (transportation, electricity, water supply) caused by a weather event (a cyclone or an extreme heat), which causes a short-term disruption, but which is overcome, perhaps with temporary electricity generators. It could also be the temporary closure of a tourism resource, such as a park that is overcome by a fire, a flood, or an off-shore oil spill. The resource will recover in due course with managed assistance. But the disruption can be significant in
the meantime.

c. **Chronic Change Drivers** (cells 5 and 6) – occur when a persistent driver of change reaches a level in which abnormal management efforts are required. This can be planned for, but usually is not, resulting in a crisis situation for both lower and higher levels in the spatial hierarchy. This is not considered a crisis or disaster because the problem was predictable and should have been manageable. Climate change has probably been the persistent driver of change that has passed the threshold to become a serious chronic issues for the tourism industry today. If not managed well, it could become a disaster for tourism, although that has not yet happened except in some isolated locations. The persistent rise in global temperatures is shifting ecosystems and making weather patterns less consistent and at times more extreme. Snow ski destinations have been among the most impacted and have taken aggressive moves in addressing this challenge (Steiger & Stötter, 2013; Hopkins & Maclean, 2013; see also chapter by Abegg et al this volume, Editor’s note). Cultural and economic globalization is another persistent change driver that some feel has also crossed the threshold to be a chronic problem (though still far from a disaster), resulting in serious declines in local distinctiveness and sense of place in many popular tourism destinations. Tourism’s contribution to the creation of this form of inauthentic landscape was, at one time, a topic of major concern among tourism scholars. The dominance of neoliberal and post-modern approaches to global development, however, has reduced this debate considerably. Finding solutions to the chronic problems of both climate change and globalization will require major commitments of time, energy and money, with outcomes that are unpredictable due to the complex nature of their causes. At a minimum, however, we should be working to prevent them from becoming disaster situations.

d. **Disaster Change Drivers** (cells 7 and 8) – occur when a threshold is passed for fast and often unanticipated change events that requires a large, coordinated management response, either within the tourism sector or across the entire community. Planning for these types of events is increasing at higher levels in the spatial hierarchy, mostly in response to fears of the impacts of global climate warming on sea level rise. This is a disaster because it is difficult, if not impossible, to predict when a life and property threatening event will occur, what its magnitude will be, and how to best prepare and manage it. As noted above, climate change is likely to reach disaster proportions sometime by the end of the 21st century. The only potentially effective way that we have to minimize its impacts is by reducing the consumption of fossil fuels, which is mostly being addressed from a chronic change perspective. As with other industries, major players in the tourism sector (multinational hotel chains and airlines) are working to green themselves with this intention in mind. Governments that have had experiences with natural disasters (such as Taiwan) are more effective at infrastructure hardening,
including the building of earthquake resistant buildings, which is another way to prepare for potential disasters. Disaster recovery planning knowledge is also available for both individual businesses and communities, although this is often only undertaken by those who perceive threats and vulnerabilities.

We have noted the long-term social impact of large magnitude of earthquake and typhoon events in the disaster experience communities of rural Taiwan, which has given them a stronger resilience outlook on community development. Interestingly, two of the non-disaster communities also had defining events in their recent history that influence their current identity. In one (the Wuweigang villages in Yilan County), the government of Taiwan proposed a power plant near adjacent wetlands in 1986. This proposal was met by strong protest from the community, which delayed its construction before the government withdrew the proposal in 1991. This event resulted in a strong environmental orientation within the community, and the wetlands have become its primary tourist attraction today, with members of the community pointing to them as a symbol of their success in defeating the power plant.

The other community (the Aogu villages in Chiayi County) experienced the slow decline of the Taiwan Sugar Company (a government owned monopoly) due to its inability to complete globally with cheaper producers. The large sugar plantation that once employed many of the community’s residents completely closed in the early 1990s and was turned into a bird sanctuary and wetland in the early 2000s. The central government (which owns the land) has long term plans to make it into an ecological park, and the local community has responded positively to the government’s top-down policies, which have included visitor centers and bird watching guide training.

These two examples show that the magnitude and direction of change can be less than that of a full blown unexpected disaster, and still have a transformative impact. In the context of the SCR2 model, the power plant proposal could be classified as a rare event that had a low magnitude impact on individuals (cell 3) and the community overall (cell 4). However, the surprise nature of the proposal was enough to galvanize a response that influenced their long term development path. The sugar cane plantation’s gradual closing (over a decade long) was a gradual and recurring event (at the time), that had a high impact on both individuals (cell 5) and the community (cell 6). Probably due to the prolonged nature of the closing, it did not create an indigenous response, other than outmigration for employment. The new identity being formed today is also a long term (persistent) change that is, so far, having only a small impact on some individuals (cell 1) and selected areas within the community (cell 2).

More case studies like these can help us to understand the likely outcomes, both short and long, of change events on communities. This, in turn, would provide an opportunity to develop
planning tools to better prepare both those who propose changes, as well as those who experience change.

3.5 CONCLUSIONS

Conceptual frameworks provide a way of organizing a complex world that is, in reality, completely beyond our logical comprehension in terms of its function, purpose, goals and existential meaning (Lew, 2010). We seek out theories that appear to make logical sense and are aligned with our experiences and understanding of phenomena. Their value is further extended when they expand our understanding in new directions that may stretch beyond the original theory or ideas. This is what sustainable development did when it was first introduced (WCED, 1987). This is also what resilience theory has been doing in recent years as the world faces new challenges that seem more perplexing than those of the past.

Resilience theory and thinking originate in systems science and the criticisms of systems science also apply to resilience. The neoliberal critique of resilience theory today mirrors that of systems theory in the 1970s when it was seen as a way for the institutional elite to justify power and prestige (Lillienfeld, 1978). Other criticisms of the systems approach question the assumption that systems can be identified as separate entities and that hierarchies are in fact hierarchical in behavior (Cilliers, 2001). Both are more fluid than static, as was seen in the Taiwan study where rural community leaders were found to play multiple roles adjusting to different contexts. Addressing the complexity of variables and interactions at play in each of the multitude of potential subsystems in a specific context can be daunting (Becken, 2013).

There are other theories and philosophies about change, including epistemological approaches to how change is tied to flow and motion (like a river), how it is embedded in time, and the degree to which change is a consistent or an inconsistent phenomenon (Mortensen, 2015). Chaos, vulnerability and risk are three other conceptual perspectives that are very closely related to resilience thinking and have contributed to its development (Faulkner & Russell, 1997; McKercher, 1999; Tsao & Ni, 2016). These, however, have not developed as fully as resilience theory has into a comprehensive framework that has the potential to address current global conditions and challenges.

The scale, change and resilience (SCR) model extends resilience theory by making it more practical and applied. It is solidly grounded in resilience thinking, incorporating essential concepts such as spatial and temporal scale, and slow and fast change drivers and variables. It can also be easily allied with other resilience concepts that were not discussed here, including adaptive cycles (a temporal change model) and panarchy (a spatial hierarchy model of adaptive cycles), adaptive management, self-organization, and latitude, resistance and precariousness (see
Chapter by Scott et al for a discussion of these concepts, Editor’s note). These were not discussed here because, while relevant, they are not essential to understanding the SCR model.

The SCR model is a framework for understanding how different systems (actors), among the complexity of subsystems that comprise a community, respond to different types of change, both individually and as a collective. Applying this to real world experiences can provide insight into how the dynamic nature of a community makes it resilient in a constantly changing world. The study of rural tourism communities in Taiwan was a first effort at understanding resilience from the SCR framework. Some of the lessons of that study include:

- The challenge of setting boundaries on hierarchical systems in a small community context
- The marked difference that a major natural disaster can make in defining the identity of a community
- The role of lower impact change events on individuals and communities
- The role of persistent versus sudden and unexpected events on community perceptions and response
- The difference between resilience-led development and sustainability-led development
- The role of government policies and programs in shaping the development paths of small communities

What is unclear from the rural Taiwan study is how long the disaster affect will remain after the event. The three non-disaster community residents did not mention any memory of a past disaster event in our interviews (which were actually not focused on disasters). At least one of the communities had experienced a major flood disaster in the 1930s, but only one person interviewed was old enough to recall that. Whether institutional memory is able to outlive personal memory in the context of small, rural communities, is open to further investigation. Tourism, through the creation of memorials and events that formalize historical events in the social and physical landscape, may be one way to preserve that institutional memory, and thereby contribute to the long term sustainability and resilience of places.

References Cited


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\[\text{This conceptualization does not include psychological approaches to community resilience, which is an almost entirely separate field of study.}\]

\[\text{We recognize that sustainability can also be more broadly defined as “quality of life”. However, because of the vagueness of that approach, we prefer a more narrow definition that is comparable in scales and context to that of resilience.}\]