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DEALING WITH COMPLEXITY IN TOURISM SETTINGS – THE APPLICABILITY OF THE “RESILIENT FUTURES PROCESS” TO THE MANAGEMENT OF TOURISM RESOURCES

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ABSTRACT

This paper examines the applicability of the concept of “resilience” and a closely associated management framework (“resilient futures process”) to the tourism context. The approach has developed as a methodological derivative of ecological systems analysis. The paper sets to explore the potential contribution of the resilience approach to tourism, by firstly outlining the ways in which tourism constitutes a “complex system”, in the first section. Additionally, it uses the example of “climate change and tourism” adaptation frameworks to explore the implications of the approach as well as some challenges with its extension towards tourism sector coordination. In the light of the tourism system being understood as a complex network of stakeholders’ collaboration the emphasis being as a mechanism supporting the coordination of diverse and imperfectly compatible assets on which the tourism sector depends. Developing and implementing adaptive management strategies inevitably starts by identifying stakeholders’ values as well as developing shared decision-making responsibilities. The ability of social and ecological systems
to cope and learn from radical change can be referred to as “resilience” aiming for
the system to build the capacity to learn and adapt. Climate change provides a
generic category of threat that arises out of global human actions (in which tourism
participates) but is predominantly external to the tourism system - both in terms of
its causes and the remedies that are likely to mitigate it. Using and applying
resilience thinking to tourism systems in cases of uncertainty is beneficial in order to
address and adapt to changing conditions. This paper explores the resilience
concept, illustrates how it can link to complex tourism systems and its potential
applicability on the example of climate change.

**Keywords:** concept of “resilience”, management framework, climate change and
tourism.

**INTRODUCTION**

This paper examines the applicability of the concept of “resilience” and a closely
associated management framework (“resilient futures process”) to the tourism
context. The approach has developed as a methodological derivative of ecological
systems analysis. It supports the broad view that, if one was to attempt to predict the
consequences of actions directed at complex ecological problems (policies,
management plans, strategies, etc.), contemporary analysis would need to embody
and integrate social concerns (cultural, economic, financial and political) with the
examination of those ecological process. The method was born of an erudite
methodological critique of conventional planning, where the latter is portrayed as
attempting to maintain systems in an optimal state or an equilibrium. The resilience
approach views this notion as deficient when dealing with highly unpredictable or
complex environments. While the “resilience approach” originally developed for the
purpose of “managing” complex social-ecological situations where the “natural” and
the “social” play distinctive but foreseeable roles, such modelling offers an avenue to
investigate alternative system behaviour and evaluate governance structures.
wherever an analytical domain is characterized by complexity and uncertainty (in ways to be defined below).

This paper sets to explore the potential contribution of the resilience approach to tourism, by firstly outlining the ways in which tourism constitutes a “complex system”, in the first section. The second section introduces and summarizes the resiliency approach itself and thirdly we examine a selected number of prior attempts to approach aspects of tourism using aspects of complexity theory making it compatible with the resilience approach. In the fourth section suggestions are made about the tourism contexts where the approach would be particularly useful and identifies major difficulties associated with its application. The paper finally uses the example of “climate change and tourism” adaptation frameworks to explore the implications of the approach as well as some challenges with its extension towards tourism sector coordination.

CONTEXT: TOURISM SYSTEMS AS COMPLEX NETWORKS OF STAKEHOLDERS

There are many ways in which the tourism system can be described as complex. Tourism as a sector is dependent on natural and human resources, the latter often categorised as environmental, social, cultural and economic – usually conceived as interacting to produce “experiences of place” consumed by tourists. A portion of those relationships between tourist and place are produced by tourism businesses, some are shaped by destination agencies, and a large proportion remains coordinated by tourists themselves.

As an industrial system, tourism can be described as a web of interlinked networks that are complex in their composition, partially integrated within industrial groupings (Leiper 1990) and often usually overlapping with other industrial sectors. From the research perspective adopted in this paper, tourism settings are conceived
as multi-use and multi-valued systems which gain from being understood and researched as such, especially when the subject matter involves designing coordination mechanisms, recommending policies or developing management strategies. The development of conventional planning strategies for tourism has long recognised the need to incorporate tourism in the wider setting of environmental, social and economic aspects of regional development with a good understanding of cross-sectoral linkages (Dowling 2003; Farrell and Twining-Ward, 2005). Also, the main analytical construct used for tourism planning has been one of “balancing” considerations and interacting forces (“achieving a balance of economic, environmental and social goals”, ensuring “a balance between preservation and development”, and an understanding “of both natural and cultural resources” (Dowling 2003:8).

Attempts to undertake such balancing acts have stumbled upon considerable practical and conceptual difficulties when trying to concurrently address potential impacts arising from the economic, environmental, political, and social perspectives. The conceptual difficulties arise from both the excessive diversity of issues that require integration, and an incomplete understanding of cross-sectoral impacts (Lee et al. 2008).

Recently, tourism research has emphasised the role of collaborative networks as a mechanism supporting the coordination of diverse and imperfectly compatible assets on which the tourism sector depends. In the context of protected areas for instance, different stakeholders must collaborate on various levels in order to maintain the resources the tourism product is based on (Wegner et al. 2004). This is because no individual organisation has the ability, the legitimacy nor the resolve to control all production aspects within a particular tourism setting (Bramwell and Lane 2000). In many tourism contexts that interact with natural resources management, collaborative approaches to tourism planning have been considered desirable in order to support decisions exposed to changing environments, to foster
a sense of ownership over decisions by stakeholders, and to pursue specific policy objectives (Buckley and Sommer 2001; Eagles et al. 2002; Worboys et al. 2005).

Collaboration is generally needed both to facilitate decisions about management objectives and to design implementation strategies. In that sense, collaborative networks support both the negotiation of possible common objectives (by allowing differing parties to discuss dissimilar views of the future) and the analysis of system dynamics (by providing clues as to the likely outcomes of the interplay between stakeholders’ discordant world views and the environmental forces acting on them). From an analytical viewpoint, tourism collaborative networks have been theorised as coordinating mechanisms particularly applicable for management in situations characterised by complexity (where structures and processes do not fall into easily ordered or integrated categories) and overwhelming ambiguity. Beyond their apparent role in circulating information, shaping incentives and facilitating the coordination of production plans, collaborative networks can be conceptualised as playing a more critical role in dealing with the extreme uncertainty which characterises the management of various types of impacts associated with tourism (Tremblay 2000a).

Tourism stakeholders are not only uncertain about the many uncontrollable aspects of their business environment (such as markets, technological change, policy, global trends, etc.), they are also not knowledgeable or unaware about the full range, nature and extent of their own impacts on each other and, as well as the consequences of their actions on the multi-layered resource base they exploit. Yet, like planners, they do recognise the limitations of their knowledge (both in terms of information missing and in lacking theories or structured frameworks, in other words “ignorance”), and in many cases, use collaboration to learn about each other’s beliefs and views regarding intended and unintended effects they have. In that sense, networks can be described as investments in “learning capital” (by organisations or stakeholder groups) aimed at providing greater coherence for the sake of identifying and evaluating impacts across stakeholders (Tremblay 2000a). While more elusive
notions of “social capital” have been extensively presented as significant assets facilitating management and decision-making in contexts where communities might naturally play a governance role on the basis of pre-existing cultural unity (Fenton 2006; URS 2007), emphasis in tourism ought to be on the multiplicity of stakeholder types and categories, and the absence of legitimate and primary coordinating mechanism.

In the tourism sector, as in other industries, many forms of collaboration can be called upon to fulfil such coordinating roles. Creating formal partnerships between two or more business or community partners, working informally in cooperation, developing joint management processes involving the public sector, undertaking interest-based negotiations, or joining forces on an ad-hoc basis to address a specific type of impact of concern constitute examples of cooperation that can arise relatively spontaneously from the mutual interests of the parties involved (Laing et al. 2008). In practice though, frameworks aimed at addressing complex systems (such as those found at the interface between tourism and environment), are often created, formulated and implemented by government agencies because many impacts categories are treated as market failures justifying unilateral action (Tremblay 1993).

While the nature of the implied bureaucratic collaboration is different from that arising from stakeholder partnerships, such coordination mechanisms face the same overwhelming predicament of having to address exceptionally complex situations that cannot be conceived as simple optimisation problems to be solved by technocrats. Solutions need to arise in the form of adaptive mechanisms capable of dealing with multiple conjectures about stakeholder values and actions as well as genuine uncertainty regarding the relationship between resource base and tourism development. In such situations, it is generally accepted that conventional planning is inappropriate and unresponsive, and that the challenges lie beyond simple balancing acts aiming at maintaining the system in equilibrium. The nature and scope of the knowledge gaps implied carry the potential to affect the integrity of the
(tourism) product and can even transform nature of the structural relationships that various stakeholders have with that sector (Lister and Kay 1999).

RESILIENCE THINKING

Originating from the environmental sciences, adaptive management refers to a general approach to strategy which places environmental complexity at its core, and proposes alternatives to conventional planning approaches. It rejects idealistic planning models based on the ability of omniscient technocrats to identify desirable end points, to gather the information required to detect the appropriate path towards those goals and to synchronise the actions of diverse and idiosyncratic agents. It is instead characterised by its objective to understand, accept, and deal with multi-faceted uncertainties through collaborative efforts of potentially conflicting interest groups (Reed 2000). Developing and implementing adaptive management strategies inevitably starts by identifying stakeholders’ values as well as developing shared decision-making responsibilities. Adaptive management seeks to address specific practical implementation problems by analytically reviewing environmental conditions and strives towards improvement in the use and coordination of resources (Daniels and Walker 1996). In the field of Natural Resources Management (NRM), adaptive management has been promoted as a way to work within situations characterised by complexity and uncertainty and adopted as a preferred approach in Australia (Natural Resource Management Ministerial Council 2006), despite apparent lack of support at the institutional levels for the practice (Allan and Curtis 2005).

While the simplest adaptive management approaches propose relatively straightforward procedures for the sake of accommodating emerging discrete environmental uncertainties, even on a routine basis, they cannot themselves address issues of greater magnitude, which have the potential to significantly transform the nature or structure of management systems being analysed or the
condition of the resource base. When dealing with environmental circumstances that radically disrupt normal operations, agents or stakeholders participating in relevant social-ecological systems can and need to prepare for the possibility of drastically different conditions, but cannot base their actions on forecasts on which to base optimal decisions. They must instead face the likelihood that many possible futures could emerge from the complex interaction of multiple factors (Allison and Hobbs 2006). From the viewpoint of the stakeholders, preparation for multiple possible futures is equivalent to strategic adaptation. Such preparation is both “mental” and organisational in the sense that it involves the anticipation that their own constructs or worldviews (used to comprehend their environment and make decisions) will likely need to change (sometimes represented as double loop learning, as in Allison and Hobbs (2006)), as well as the heuristics, theories or policies that they use to act on their analysis of given situations.

The ability of social and ecological systems to cope and learn from radical change can be referred to as “resilience” and will be defined in more detail below. The elements making up “resilience thinking” are not necessarily new, but the framework that has developed predominantly from applications connected with ecological systems, and later linked with physical and engineering systems (and rarer recent extensions to social systems) constitute an original framework associated with the work of C.S. Holling and collaborators (Holling 1973; Holling and Gunderson 2002; Carpenter et al. 2001; Janssen 2007; Walker and Salt 2006).

Resilience thinking provides a framework based on the concepts of systems thinking, complexity and complex adaptive systems which is being adopted as a means to understand decision-making processes attuned to complex environments such as those faced by contemporary managers (Allison and Hobbs 2006). Rapid changes and increasing complexity due to the social and economic interconnectedness between individuals, local, regional, national and global settings call for a different approach to management when systems cannot be simply decomposed (Loasby 1976) and decisions cannot be based on a stable configuration
of conjectures. However, it is immaterial whether environments are in reality more complex, or whether it is the greater scope of factors modern decision-makers (entrepreneurs, managers, planners) must consider to perform their duties. The need to think differently about managing complex situations is corroborated by the rapid increase in the number of converging publications from 1995 in the areas of resilience, vulnerability and adaptation in research on topics such as the human dimensions of global change (Janssen 2007) and the related area of community resilience in response to disasters (McManus et al. 2007; Norris et al. 2008).

The resilience paradigm challenges the standard perspective in which there is a single best way, or answer, to a problem and replaces it with the notion that coalitions of stakeholders need to build capacity towards addressing and working with changing conditions. A number of hands-on approaches have been developed to attempt to put the theory into practice. The Resilience Alliance (http://www.resalliance.org/1.php) has developed a process of assessing and managing resilience in social-ecological systems, explored in this paper. Originally, a set of key concepts underlying resilience thinking provided a framework for assessing the resilience of natural resource systems and for considering management options to set the system on a sustainable trajectory. The agenda was developed originally to provide guidance for people engaged in NRM, through a set of activities designed to explore system parameters and management options for their own system of interest within a resilience perspective. For instance, a ‘social resilience’ approach through co-management was applied in the Caribbean using community-based management in order to develop climate change response strategies (Adger and Tompkins 2004). This project resulted in an increase in the community’s social resilience to address various types of rare but plausible disasters through the networks they developed. The next section describes the Resilient Futures Framework, which outlines practical considerations that need to be considered when trying to put into practice the theories of complex adaptive systems and resilience.
RESILIENCE FRAMEWORK AND PROCESS

The way we perceive problems and how we go about decision making depends on human interpretation of new data and information against pre-held constructs (Meadows and Robinson 1985). Past and present information themselves influence the constructs (or interpretation frameworks) we hold, which serve as the basis to make or update predictions about the future, to decide and take action. Knowledge of circumstances is generally distributed (no one person or any group has sufficient knowledge to support even very simple decisions or actions) and the condition of “partial ignorance” characterises any individual decision-maker (Loasby 1976, Tremblay 2000a). The resilience approach recognises explicitly the need to address this diversity of interpretations found among relevant stakeholders interacting in social systems. That diversity is seen as habitual, and can be portrayed as a resource in itself. For the sake of adapting to totally unexpected events, new interpretations are required. It is important for any system to generate sufficient variety in interpretations frames to maintain a healthy level of diversity (Loasby 1976). In some circumstances more diversity is desirable, in other contexts, coherence is required. An abstract view of resilience would relate the ability of a system to match the coherence-diversity mix of constructs (or mental models) that characterise it to the type of environmental changes that affect it.

Building on the micro-foundations of abstract constructs, a generic framework was developed that identifies the three factors that need to be considered to take a systems perspective of a problem or complex situation (as shown in Fig 1). Any evaluation of a complex situation requires the integration of three things: (1) the mental models of the problem solver or solvers, (2) an investigation of the problem situation, and (3) the adoption of the appropriate method to address the problem (Jayaratna 1994; Allison and Hobbs 2006).
The idea that there were different types of problems and that some problems are more tractable because structurally contained was developed in the 1970s when (Rittel and Webber 1973) started to distinguish between ‘tame’ and ‘wicked’ problems based on their framing characteristics. Social problems have the characteristics of wicked problems where there was no true or correct solution. Latter categorisations classified problems as routine, complicated, complex or chaotic in the sense-making framework of (Kurtz and Snowden 2003). Later research suggested that social problems require an “explorer” perspective rather than an “analytical” perspective in a similar sense (Kay 2007).

The most common practical definitions of resilience nowadays refer to the ability of a social-ecological system to withstand disturbances and retain their integrity in some measurable way. Empirical ecologists refer to ecological resilience as the magnitude of disturbances that can be tolerated before a system moves into a
different region of state space (as in Holling 1973, 1996). Based on such an interpretation, resilience has the following three properties that apply more or less directly to social contexts (Carpenter et al. 2001):

(a) the amount of change the system can undergo (and by extension, the amount of extrinsic force or intrinsic turmoil the system can sustain) before losing its integrity (that is, retain the same controls on structure and function);
(b) the degree to which the system is capable of self-organisation (versus lack of organisation, or organisation forced by external factors); and
(c) the degree to which the system can build the capacity to learn and adapt.

Two central themes that underpin resilience thinking follow from the above (Walker and Salt 2006), these are thresholds and adaptive cycles.

**Thresholds**: social-ecological systems can exist in more than one stable state and may cross a threshold or tipping point into a different state when there has been too much change.

**Adaptive cycles**: change over time or cycles of change are common in many systems, and follow typical patterns in applications to the natural sciences. The common sequence of change is rapid growth, conservation, release and reorganisation, shown in the figure of 8 (Fig 2). Resilience cannot be measured by addressing criteria from any one of the four phases but is a factor of the ability of a system to move through the four phases, taking into account the changes that are occurring. Resilience is the capacity of a system to absorb disturbance without crossing a threshold and shifting into a qualitatively different state.
Also emerging is the distinction between adaptive and transformational change. When rates of change are low and occur over long time scales the system is self-organising and adaptation occurs. However, feedback processes may cause non-linear process to occur and the system may cross a threshold or tipping point in which transformational change is required.

Emerging from systems and resilience literature the Resilient Futures Framework and Process (http://www.resilientfutures.org/) are designed to frame the problem or opportunity as a whole and complex system. This process may at first appear to be confronting when the ‘business as usual’ process is that of analysis or breaking
the problem down into its individual parts rather than organic transformation. The framework is shown in Figure 3. Before any action can take place it is essential to gain a notional understanding of the complex situation in terms of networks of stakeholders’ diverse sets of problems or opportunities. Without this, new configurations of stakeholders cannot self-design to accommodate new circumstances. The framework was created in order to fully characterise a complex problem situation. It is made up of six elements: connectivity, conditions, capability, capital, conversation, and catalytic actions or projects, which are interlinked. In situations where change expresses itself through multiple, highly connected channels, analysts need to identify such ranges of conditions across several temporal and spatial scales. The terminology typically refers to the micro, mega and macro spatial scales, as well as immediate, emergent or recurring temporal conditions. Considering such levels is necessary because stakeholders typically focus on fitting analytical scales and avoid aspects or scales that lead to conflicts or require greater cognitive investments.

**Figure 3: The Resilient Futures Framework**
As each problem-solver enters the process with their own distinctive worldviews, they always face conditions of partial ignorance, each with their own ‘blindspots’, which are more than mere gaps in knowledge. They cannot therefore separately assess whether the issues they confront are routine or extreme (in the sense of the degree of complexity or uncertainty they entail). The Resilient Future Framework and Process therefore aims at as wide a range of stakeholders and constructs as possible to include in the process. This upholds the well established theoretical view that diversity (of constructs, of interpretations, of organisational structures, etc.) constitutes the key to upholding social and economic sustainability when radical change is imminent (Loasby 1976). The Resilient Futures Process attempts to map the nature of the incumbent diversity of worldviews by investigating stakeholders’ perspectives on connectivity, conditions, capability, capital, and by engaging stakeholders in a conversation around a project that becomes the catalyst for action.

THE APPLICABILITY OF THE RESILIENCE APPROACH TO TOURISM

Some of these ideas discussed above have been employed within the context of tourism organisation and sustainability. It is not the intent of this paper to cover all the applications of systems thinking to tourism (Baggio 2008 provides a comprehensive survey of the systems thinking aspects) but it is useful to re-establish that elements of complexity and chaos theory have already attracted the attention of various tourism researchers. In particular, the concepts of complex systems have been used to reinterpret the lifecycle analysis of tourism destinations (Baggio 2008; McKercher 1999; Russell and Faulkner 2004), the organisation of tourism businesses and marketing positions (Tremblay 1999, 2000b), the analysis of the relationship between local and global social linkages through tourism (Milne and Ateljevic 2001) as well as aspects of tourism planning (Bramwell 2007).

Looking back, it seems in fact incongruous that so much of the early literature on tourism organisation started its analysis of the topic by identifying the
distinctiveness of the tourism product (place of production, perishability, volatility, non-stockability, etc…) and the particularities of its coordination as an industrial sector (fragmentation, partial industrialisation, etc.), but then proceeded to apply conventional narrowly focussed planning and management paradigms. Consequently, much of the tourism research agenda over the last few decades has been directed at measuring, stabilising, optimising tourism, while minimising its impacts, and matching its supply and demand. The perceived fragmentation of “the sector”, and the particular coordination needs associated with this repeatedly identified state of affairs have led to endless calls for greater collaboration across tourism organisations and related sectors. In contrast to the view that tourism is a fragmented system in need of greater integration, Tremblay (1999, 2000b) has argued that it is rather driven by the continual need to generate “novelty”, originating from both consumers and producers, and that the resulting systemic diversity is bound to sporadically create turmoil.

Most usual commentaries about tourism “resilience” tend to refer to unexpectedly rapid recovery of the broad, global tourism phenomenon following external shocks to the system, ranging from health crises, war and terrorism disruptions, business and economic catastrophes and natural disasters. High profile international events of the last decade, such as the September 11th terrorist attacks, the Indian Ocean tsunami, Hurricane Katrina and the emerging threat of a pandemic virus, served both to remind that an improbable event can and does happen, and that tourism as an industrial system has the capacity to learn how to deal with various types of shocks (Baggio 2008).

While such references to “resilience” are usually based on a rudimentary or layman’s interpretation and based purely on basic statistical observations (referring generally to some recovery in the number of visits in a region), they convey the suggestion that tourism itself constitutes a systemic entity vulnerable to serious disruptions, which could be radically affected by such shocks (presumably in its performance or structure) and even disappear. When approached in such a manner,
it is possible to examine whether tourism itself constitutes a system to which the Resilient Futures Framework can be applied. Applying the framework requires considering the following questions:

1. What is the nature of the system that can be maintained but is also vulnerable?
2. What drives that system and what threats make it vulnerable?
3. Is it possible to set boundaries (organisational, spatial and temporal) allowing the governance of tourism process to be practically bounded, more “closed” and resilience engineered (so as to filter out obvious threats)?
4. What needs to be learned about the factor(s) that threaten the integrity of the tourism system and what degree of change (or thresholds - defined in scope and/or magnitude) would be excessive?

The questions above are purely illustrative and are not intended to be answered in this abstract discussion. It is useful to note that the tourism system produces “value” in a number of ways that need to be described in specific contexts, and it is difficult to establish a common basis for systems that do not originate from ecological analysis. In terms of drivers (the second question), tourism systems are shaped by a number of dynamic and interacting local and global forces. Answering the third question might appear particularly complex as generic statements about resilience rarely display sufficient sophistication to address multiple scale issues (Cumming et al. 2006). While temporal and spatial boundaries have played an intrinsic role in the definition of “the tourist” and in some of the most widespread models of tourism management, “destinations” as regions or places organised to sustain tourism arrivals have come to dominate tourism planning. The fourth question must be the most challenging as it requires a representation of the tourism system (possibly as a configuration of abstract interconnected sub-systems), its functionality and a theory of how its current interpretations and constructs affect decision-making in various circumstances. From that, a number of shocks (recurrent or occasional) could be
imagined which would impede dramatically on the integrity of the system, at a scale or speed that would overwhelm its learning capability.

To complete this hypothetical discussion and explore the limits of the concept, it is necessary to query what it would mean for a tourism system to collapse and potentially cross a threshold. The answer would likely be closely aligned with our constructs of the system, its values, boundaries and drivers within the resilience thinking framework. A number of possibilities can be suggested that would constitute representations of the system’s collapse or radical transformation, including:

- Statistical performance deterioration (tourist arrivals, etc.);
- Radical change in market composition;
- Deterioration in competitive position;
- Visible deterioration of resource base or explosion of impacts (new and anticipated);
- Breakdown of past governance structures, loss of formal and informal networks supporting system coordination, likely to lead to failures to agree on interpretations of the situation and causes, etc.

All the above are imaginable, but would not necessarily be equally recognisable. An important outcome of this abstract exercise is the identification of some ambiguity regarding the finality of the tourism system, for the theory to apply. The tourism system can conceivably be portrayed as producing value to consumers, wealth for a destination, jobs for a community, cultural preservation for an ethnic group, alternative uses for threatened natural resources, etc. In all cases, a “community reference group” seems needed for the purpose of building resilience and supporting the values implied. It is perhaps a weakness of the approach in social-economic contexts that it cannot easily assume supra-community goals (such as the preservation of habitats or ecosystems as done in the ecological-social applications). The next section explores the interface between tourism and climate change, the
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latter contributing notionally to the tourism system’s vulnerability and providing a useful set of potential application of the concept of resilience.

TOURISM AND CLIMATE CHANGE – AN EXPLORATION OF THE IMPLICATIONS OF THE “RESILIENCE” APPROACH

The considerations below follow not from a case study (although some of the authors are involved in current Australian research in tourism and climate change), but on an investigation of the applicability of the framework. Most resilience modelling begins with the identification of present or potential threats to natural capital assets, and builds an argument for the need to include social and economic governance structures as means of building adaptive capacity to deal with emerging threats. Climate change provides a generic category of threat that arises out of global human actions (in which tourism participates) but is predominantly external to the tourism system - both in terms of its causes and the remedies that are likely to mitigate it. The question of whether the resilience approach readily applies to social domains remains open as it is unclear whether social systems can be modeled around “attractors” equivalent (displaying similar dynamics characterised by identifiable thresholds) to those that have been shown for ecological systems (Walker et al. 2006). Furthermore, it is questionable whether sustaining tourism resilience constitutes a legitimate final goal when discussing climate change, or whether it is better conceived as a sub-system falling within greater social-economic considerations.

For the sake of the argument, climate change seems to fulfil remarkably well the role of a focal disruption making existing tourism systems vulnerable in the sense sought by the present approach. It is worthy of note that Loasby (2001:11) when discussing adaptive behaviour of agents following “substantial novelty” within biological or economic systems uses the metaphor of “a change not of weather but of climate” to distinguish between routine uncertainty (falling within expected patterns) and
changes in the logic of the system (requiring new constructs from decision-makers).
Climate change therefore falls within the “wicked problems” category defined earlier (Ludwig 2001) to the extent that they are perceived as intractable because they “have no definitive formulation, no stopping rule, and no test for a solution” and ultimately unlikely to reach a final resolution, the identities of the decision-makers themselves being highly uncertain.

Much of recent discourse about climate change also uses the language of vulnerability (of major human and ecological systems) and of irreversible thresholds where threats to society and industry are expressed in terms of tolerable changes. It is consequently legitimate to develop conjectures about the nature of resilience towards climatic turbulence - for what is seen as a complex set of interacting potential disturbances (with unclear magnitudes, uncertain implications and ambiguous trajectories). Applying the definition of resilience based on self-organising capabilities to tourism, we may query what types of such alterations could be envisaged to affect that system. A definite message emanating from the resilience approach is that we should expect (from a resilient system) adjustments in the networks and relationships between components or parts of the system, rather than a collapse of its overall structure or even the disintegration of the main components themselves.

If the system was described as a collection of private and public organisations, the set of climatic disturbances would be expected to lead to a reconfiguration of the roles and areas of responsibilities of those organisations (in terms of characteristic coordination functions) across its specific regional tourism system. In fact, the reorganisation of system components can be expressed in a number of ways. Firstly it could be interpreted as a shift in the nature of the tourism product bringing about modifications to the set of experiences available to tourists and leading to a shift in the market segment mix. Secondly, it could be construed as a transformation of the nature, scale or boundaries of the tourism destination, in terms of its relationship to natural and cultural landscapes. Thirdly, it could be expressed in terms of the way
government and industry “do business” and their relative roles. Fourthly, if the analysis was directed at broader social and economic meta-systems in which tourism was incorporated as one of the components, the anticipated reconfiguration could be expressed in terms of a shifting role of tourism within a regional economy, with its base community or a mutation in the determinants of regional tourism competitive advantage.

For each of the examples above, the typical process would aim at identifying intolerable levels of disturbance, their likely impacts on the system-regime (the social equivalent of the resource base) and the nature of the investments required to prepare for the expected threats. Current empirical work in progress in Sustainable Tourism CRC projects on climate change suggests that stakeholders’ views about required adaptations to various climate pressures can be differentiated on the basis of a number of dimensions. Stakeholders range with respect to the idealist-fatalist personal outlook they hold regarding the likelihood of exceeding a catastrophic threshold level. They also differ with respect to the reactive-proactive attitudes they express regarding the need to plan for system restructure (ranging between the confidence that small or routine adjustments to behavior will be sufficient to maintain the system in balance to the belief that radical adaptation, and possibly unilateral preparation is urgently required). When asked, stakeholders considering climate change impacts in their regional tourism systems contemplated measures as diverse as trivial operational adjustments of business firms, to engineered changes in the market mix reflect changing regional competitive positions and some went as far as probing the relationship between tourism and environmental assets.

The latter considerations raise questions about the nature and position of the leadership required to implement adaptation strategies and take charge of regional preparation within tourism. The issue is in itself typically complex and sensitive because of “issues relating to mismatch of scales” (Cumming et al. 2006). For any specific case of regional tourism preparation, adaptation strategies might well advocate a realignment of coordination responsibilities along a new, desirable scale
of “management” better reflecting the anticipated costs and benefits within the system. Even within the domain of climate change issues, different scales seem warranted to deal with mitigation and adaptation issues. The implied institutional changes arising from such analysis are by no means easily negotiated or implemented across groups with vested interests. Resistance to change from competing political institutions can also constitute one of the greatest obstacles to system reconfiguration.

If learning constitutes the most critical component of adaptability, investment in resilience will need to focus on the choice between alternative learning strategies, in particular about developing learning capabilities fitting the type of turbulence anticipated by stakeholders and analysts. Highly volatile environments require learning investments in the form of careful experimentation, rather than excessive attempts to accumulate data and information suitable for simple environmental predictions. In such environments, decision-making structures based on quasi-perfect information need to be replaced by knowledge and understanding of the connections between system components and their likely reactions to each other perceptions of the nature of change.

While some stakeholders hold the belief that centralised decision-making and planning by government agencies constitute the ideal platform to develop the required strategies, the resilience approach suggests that original coalitions of stakeholders need to be developed to instil the appropriate type of learning. The current reliance on incumbent bureaucracies (for instance existing government organisations playing the key gatekeeper roles in tourism coordination) might limit the production of new solutions to emerging problems. The main reason for this state of affairs remains that organisations (and stable networks of stakeholders) specialise in the way they learn (Loasby 1976, Tremblay 2000b) over time they organically create unspoken assumptions or agreed “plots” that underlie management practices (Allan and Curtis 2005). Learning structures that have developed to support tourism coordination in a stable context for instance, are
unlikely to be the most productive to deal with the new conditions. In fact, the application of the resilience approach to tourism suggests that it would be desirable for leading stakeholders to engage in a healthy debate about the desirability of alternative learning strategies for regional systems, and to explicitly recognise the trade-off between static and dynamic efficiency.

The last general proposition emanating from the application of the resilience approach is the need to maintain a significant level of diversity in the adaptive system. This can be justified in a number of ways. Not only will the arising turbulence trigger novelty (internal to the system) that had been simmering in the background, but diversity of interpretations will be needed (based on divergent worldviews, perception and decision-making, as in Allison and Hobbs, in press) to recognise the potential trajectories the system could follow, to debate it and to generate the radical innovations that will position the system to respond to the original external threats. Diversity is healthy in such contexts because it offers flexibility and it is productive as such. The resilience approach indicates that the ability of the tourism system to respond to the unforeseen consequences of climate change will ultimately depend more on the diversity of stakeholder configurations and interpretations of their environments and the debates that might ensue than on some engineered consensus as to the optimal level of action that would maintain the sector on track.

CONCLUSION

Using and applying resilience thinking to tourism systems is beneficial in order to address and adapt to changing conditions. This paper explored the resilience concept, illustrated how it can link to complex tourism systems and its potential applicability on the example of climate change. The aim was not to delve into the issue of climate change with respect to a specific destination/location, rather illustrate the importance and applicability of resilience theory to an emergent issue
effecting and impacting tourism as a whole. As such, it allowed us to develop simple propositions as discussed above.

Farrell and Twining-Ward (2005) already proposed with the help of ‘seven steps’ a necessary change in direction from a traditional view in tourism to a more encompassing approach. According to these authors one of the most important drivers to successfully apply resilience theory in tourism is a change in one’s world view. Taking into account this knowledge and the complexity of tourism, it becomes apparent that much more work and research remains to be done to fully understand the concept of and successful implementation of resilience as part of tourism systems. Some aspects to consider and address may be:

- The development of learning strategies in tourism systems and the conditions that allow regional tourism systems to adapt to changing environments;
- To contemplate how the six (social, ecology/environmental, aesthetic, economics, knowledge, and build form) components of the resilience futures framework could be incorporated into tourism planning and management-decisions;
- To understand and review organisational structures of regional systems and their relationships to the production of novelty and innovation;
- To increase the involvement and acceptance of diverse stakeholders as part of different (often controversial) groups;
- To use a holistic approach in viewing and addressing emergent “wicked” problems within a tourism setting.

REFERENCES


