KNOWLEDGE MANAGEMENT FOR TOURISM, RECREATION AND BIOCLIMATOLOGY: Mapping the Interactions (Part II)

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ABSTRACT

The fields covered in the workshop of tourism and recreation climatology (biometeorology, bioclimatology, thermal comfort and heat balance modelling, tourism marketing and planning, urban and landscape planning, architecture, climate change, emission reduction and climate change impact assessment) refer to a wide variety of spatial scales and scopes of tourism policy intervention. To more effectively address these challenges as a cooperative scientific network, a knowledge management approach can be of assistance in identifying commonalities, differences, and information gaps among studies. To this end, this paper reports on the development of a conceptual platform for the meta-analysis of ongoing tourism and climate change research. This diagram is particularly suited to the Crete conference, given the mission of the Orthodox Academy of Crete to encourage discourse and dialog among opposing viewpoints. It was designed to challenge the assumption that the first step to designing clear policy in tourism climate change interactions is to select and defend a strategy of *either* adaptation *or* mitigation. The purpose of this paper is to benchmark and discuss the evolution of the 'State and Change' diagram (1, 2), thereby advancing tourism and bioclimatology knowledge management.

KEYWORDS: *Systems theory, Tourism, Recreation*

THE EVOLVING CONCEPTURAL MODEL FOR TOURISM AND CLIMATE CHANGE

Optimal use of information generated by tourism and recreation bioclimatology requires providing information and infrastructure, dealing with conflict, understanding compliance to social rules, and preparing institutions for change. Policy debate and knowledge can be most productive precisely when different contributors reveal different interpretations of key issues. An effectively designed conceptual model will: place the body of research in neutral ground,

be inclusive to multiple perspectives, be used strategically to neutralize polarizing tendencies (3, 4, as cited by 5), and promote new collaborations.

The fields covered in the workshop of tourism and recreation climatology refer to a wide variety of spatial scales and scopes of tourism policy intervention, and present a notable challenge of knowledge integration. Construction, modification, and use of conceptual models are participative activities that capitalize on the rare opportunities of face-to-face interaction. This paper is representative of some of the ongoing discussions which have occurred between researchers. Reporting on the changing diagram as a benchmark is important because in the acts of building up, tearing down, and rebuilding again, researchers become fluent in using the jargon, concepts, and tools of measurements necessary to communicate across disciplines and case studies. If viewpoints cannot be reconciled within a given conceptual map, this also draws useful attention to epistemological differences which may otherwise be overlooked. Active, focused, and participative use of conceptual models can assist a research group such as the International Society of Biometeorology, Commission on Climate Tourism and Recreation (ISBCCTR) in reaching its fullest potential.

THEORETICAL BACKGROUND

The construction of the 'State and Change' conceptual map (1) was informed by a few important areas of research: adaptive governance, adaptive management (6), integrated assessment (7, 8), and general systems theory (9, 10, 11). The common link among these areas is that they not only accept differences, but they emphasize differences in perspectives, interests, fundamental philosophies. They also test conditions as a means to spark learning and change. New to the diagram presented in this paper is the incorporation of two bodies of literature- the first of which focuses on successful system transition (12, 13), and the second on successful system tempos (ie. the multiple paces of system change) (14). These concepts and discussion with members of the ISBCCTR and the *èCLAT* network, led to a refinement of the terms and concepts presented in the diagram which follows.

CONCEPTUAL MODEL 1: ADAPTATION OR MITIGATION?

The first conceptual model presented depicts the tourism/climate change system as 'a two way street': climate influencing tourism, and tourism influencing climate (Figure 1).

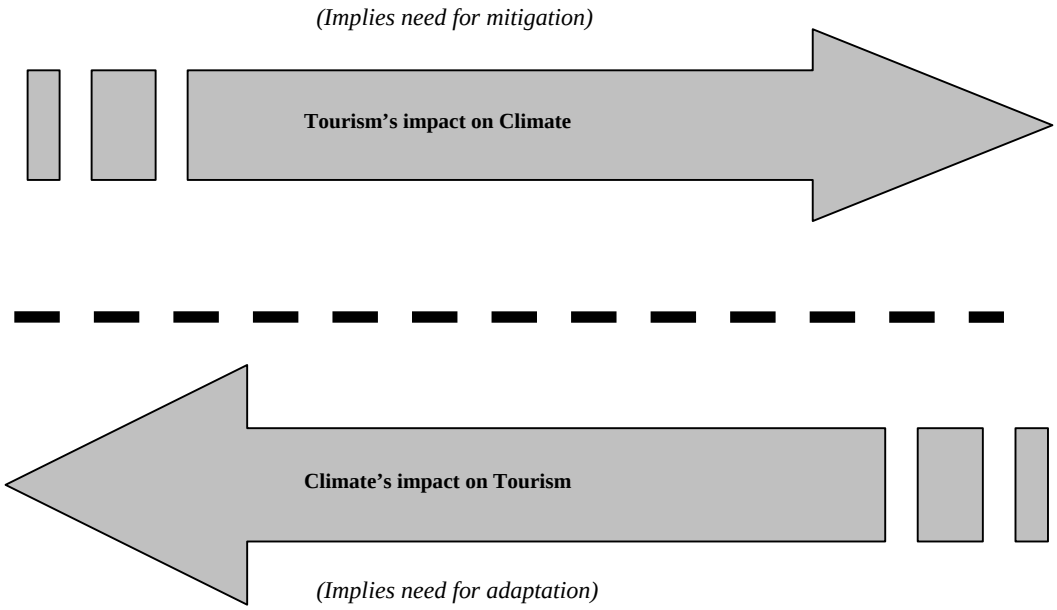

Figure 1: The tourism-climate change system is typically illustrated as a two-way street

When attention is focused on climate's influence on tourism, adaptation to changes in climate is viewed as the most urgent area of knowledge. When tourism's influence on climate is a primary concern, discussions center on mitigation. Thus, when finances, time, or other resources for problem solving are limited, adaptation and mitigation appear almost as mutually exclusive options. Concerns for economy and environment appear to be diametrically opposed. Under this conceptual model, win-win solutions are precluded: to advance in one direction means that less progress is made in another.

CONCEPTUAL MODEL 2: STATE AND CHANGE

The design of the second map is strategic in two ways. First, it joins, rather than divides, the two perspectives offered by model 1: that of the tourist and tourism industry's effect on climate, and that of climate's impact on the tourism industry and destinations. Second, it was designed with the idea that the tourism/climate system is dynamic, has multiple scales and feedbacks to consider, and that system drivers underlying these dynamics are not discussed in current research. Advancing the state-of-the-art at the intersection of tourism/climate knowledge means addressing the challenge of referring separate factions of investigation to what is ostensibly a broader, self-organizing, non-linear feedback system (Figure 2).

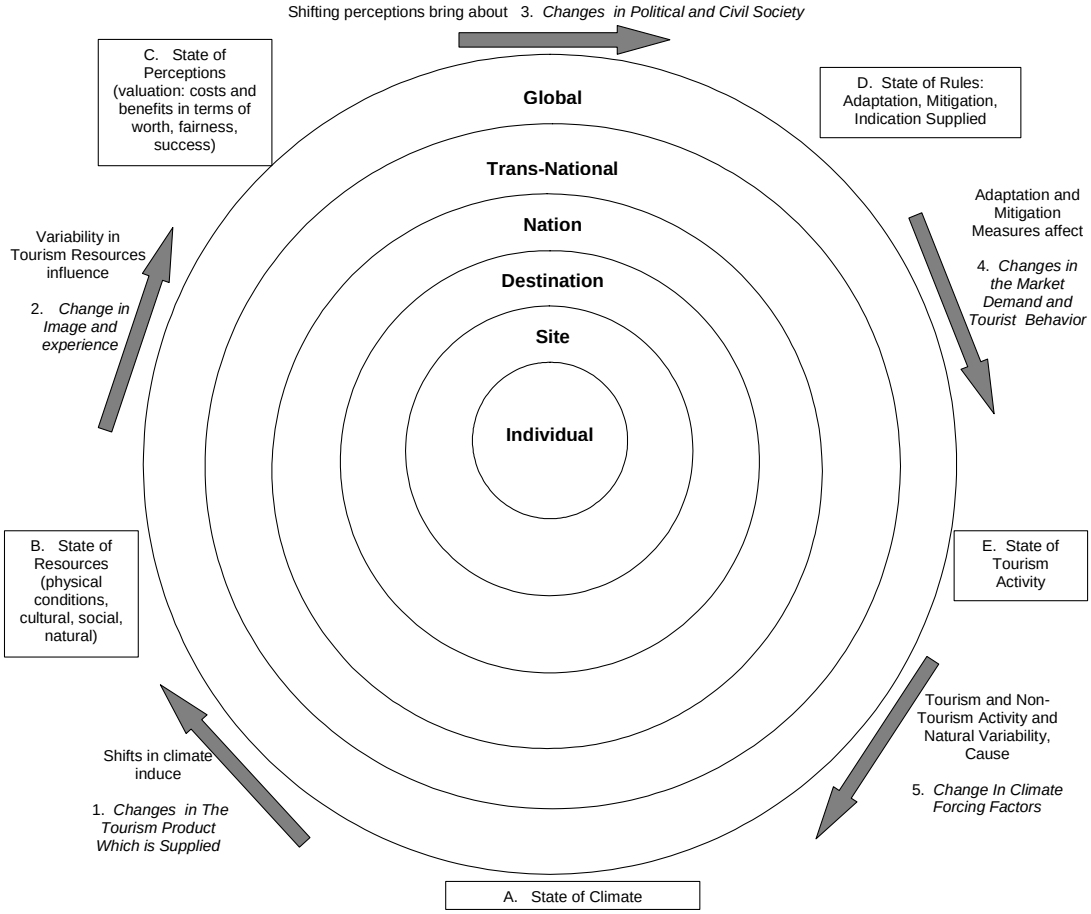

Figure 2: An updated version of the tourism/climate system

TRANSITION

The diversity of topics covered in tourism and recreation bioclimatology underscores the difficulty that tourism policy makers face when integrating this information and selecting appropriate interventions. From the standpoint of a tourism policy maker, a bioclimatic approach to tourism management will not only effectively identify these leverage points, but will also use interventions from other public entities to support the most consistent and enduring change. This requires some shift in approach, whether comparing experiences among destinations, or linking entities which deal with tourism management at multiple scales, or coping with tourism stakeholders who hold disparate interests with regard to climate and how tourism should be managed. The goal of integrated knowledge management in tourism bioclimatology is to bring about more effective transition. Rotmans et al (12) define a system transition as a gradual, continuous process of structural change within a society or culture. Rather than being deterministic, transitions adapt, learn, and anticipate new paths through exposure to time. The ways in which intervention takes place in a system transition

can influence scale, speed and direction, but system control should be considered to be limited and temporary. Tempo is relevant to two distinct dimensions of system transition as reflected in this diagram: multiple scales in space as defined at a given time, and multiple states through time as measured in a single space.

TEMPOS IN SCALE

The first of these two dimensions is straightforward. The conceptual model (Figure 2) was designed to reflect multiple spatial scales of investigation. Within the diagram, a concentric set of circles allows researchers to specify the applicable spatial scale of their work, from individual to global measurement/application. Differentiating scales explicitly in this way draws attention to the fact that, among the scales specified below, timesteps are usually not congruent. Societal, economic, and ecological changes can occur at any range of time period- from an immediate agreement among two cooperating individuals, to coordinated movements among individuals which take decades or more to emerge. Because little attention is called to this issue in tourism research, interventions are not coordinated well among scales, nor is the optimal scale for intervention necessarily selected. Increased attention to scale will allow tourism managers to reach a more optimal balance between quantity and quality of information supplied.

Table 1: Tourism and recreation bioclimatology scale descriptions

SCALE	
Individual	Autonomous concerns, perceptions, behavior and decisions
Site	Location such as beach, park, hospitality facility, hotel, etc.
Destination	A particular region or group of sites with homogenous marketing characteristics
National	National policy or actions
Trans-national	Policies which influence two or more nations
Global	Global commons as a whole

TEMPOS IN STATE

Another relevant challenge to knowledge management for tourism and recreation bioclimatology is that the tourism/climate system is continuously dynamic. This means that bioclimatic researchers are faced with case studies and data collections which are often

difficult to separate out from external conditions, or repeat. Therefore, the second tempo relevant to system transition has to do with this dynamism- tracking information at a given area through multiple timesteps. The terms 'stock' and 'flow' in dynamic modeling are useful to understanding the relationship between 'state' and 'change'. The boxes in figure 2 represent 'states'. These are the aspects of the tourism/climate change system that change relatively slowly over time. They can be described in terms of quantity and quality. Between these stocks lie 'changes'. The arrows in the diagram represent the flows which adjust relatively rapidly, and from which the relationships between the stocks can be discerned. Research in tourism and climate change can be categorized as attempts to reveal the quantity or quality of these states, or the relationships of change among them.

The changes in syntax and refinement in concepts can be explained as follows. The bottom of Figure 2, represents work done to establish the *State of Climate* (A). Moving left on the diagram, leads to an area which represents research done that relates shifts in climate, and how they induce *Changes in The Tourism Product Which is Supplied* (1). The next state established is the *State of Resources* (physical, cultural, social and natural conditions) (B). Next, the upper left sector of the diagram represents work done on how variability in tourism resources influence *Change in Image and Expferience* (2). Research work done on documenting the *State of Perceptions* (valuation: costs and benefits in terms of worth, fairness, success) (C) is represented at the top of the diagram. At the upper right corner is an area representing investigations of how shifting perceptions bring about *Changes in Political and Civil Society* (3). To the right of that area is one which represents the *State of Rules*: (adaptation, mitigation, and indication supplied) (D). Next, adaptative and mitigation measures effect *Changes in the Market Demand and/or Tourist Behavior* (4). This leads to an area of the diagram representing the body of literature and indicators which document the *State of Tourism Activity* (E). The last set of research in this conceptual map is that which considers tourism and non-tourism activity and natural variability, as they bring about Change In Climate Forcing Factors (5). This brings us back around to the work which documents how these climate forcing factors influence the state of the climate (A again).

TEMPO AND TRANSITION

Unexpected bioclimatic conditions can cause an impact on tourism destinations both in the short and long term. The variety and extent of climate impacts on tourism highlight the importance of extending the tourism bioclimatology knowledge base beyond interventions which act at only one spatial scale, at only one point in time, or without the full range of

institutions which might otherwise bring about change. Systems theorists are interested particularly in actions which trigger others, thereby supporting changes "spiraling through a system" (7): in other words, profound and prolonged shifts leading to new stable states. The 'success' of a transition, according to Rotmans et al (12), is one hallmarked by multiple causality and co-evolution of independent developments. How deeply tourism policy changes are linked to and reinforced by predictable tendencies of economic, environmental, and social systems has much to do with how that change will persist through time, and to what extent. A complete description of system transition in the tourism/climate change system must address tempos of state and scale.

DISCUSSION

This paper attempted to describe developments to a conceptual map which relates tourism and climate change as an integral system. As explained in Patterson (1), previous studies relating tourism and climate change have tended to adopt one of two perspectives: climate's influence on tourism, or tourism's influence on climate. Bioclimatic problem solving for tourism management requires collective examination of shared concepts and knowledge, drawing out various assumptions and causal links between areas of research interest, and identifying gaps in understanding. The conceptual model presented is a good context within which to place recent tourism and recreation bioclimatology research, particularly because it orients discussion of the problem solving community away from the academic tendency to depict the most complex problems as polar opposites (5), away from an idea of short-term optimization (11), and away from an idea that either adaptation or mitigation can be exclusively successful strategies.

When discussing the tempos and transition of knowledge management in tourism climate change systems, two themes are emphasized: first, addressing various spatial scales, and second using measured time-steps to explicitly examine the causal links between aspects of supply/demand and climate forcing/intervention. Knowledge about a system can be structural (the quantity or quality of something about the system that changes relatively slowly over time), or functional (the relationships between elements of structure, ones which change relatively rapidly over time). These terms are similar to 'fast change/slow change' or 'stock/flow' descriptions found in dynamic modeling. In this paper, this aspect of tempo of system transition is in part reflected by separating out the 6 system states, from the 6 system changes. This information is complimented by tourism and bioclimatic information about spatial scales, from individual to global extents.

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